

AMERICAN ARTISAN

WARM AIR HEATING • AIR CONDITIONING
SHEET METAL CONTRACTING

JANUARY
1937
DIRECTORY
NUMBER

ESTABLISHED
8 8 0

Residential
Conditioning
Section
Page 73



Ability!

Berger has the ABILITY to supply jackets for every heating and air-conditioning need!

● Let Berger modernize and beautify the boilers, oil burners, water heaters, stokers and air-conditioning units you manufacture, with Berloy steel jackets tailored to individual needs!

We can definitely help you create a greater demand for your products. A highly competent, widely-experienced staff of designers is prepared to analyze your requirements, and submit recommendations.

Berloy metal-working specialists, supported by complete, efficient facilities for sheet metal products of every description, can develop low-cost production schedules for your jackets.

Tailored steel jacket for oil-burning, air-conditioning unit, especially made for the Fox Furnace Co., Elyria, Ohio.



Write Berger for free engineering advice on your jacket problems, now!

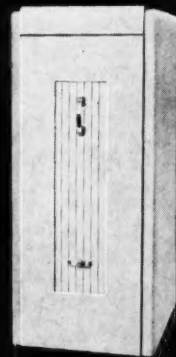
THE BERGER MANUFACTURING CO.

{Division of Republic Steel Corporation}

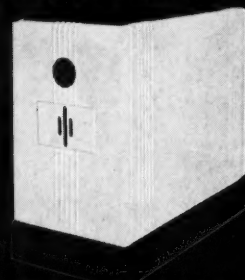
CANTON, OHIO



STEEL—Tailored To Your Needs



Tailored steel cabinet for hot water heater, especially made for The Roud Manufacturing Co., Pittsburgh, Pa.



Tailored steel cabinet for hot water heater, especially made for the Lovekin Heater Company, Philadelphia, Pa.



Tailored steel cabinet for gas furnace, especially made for the Richmond Radiator Company, Uniontown, Pa.



Tailored steel jacket for gas furnace, especially made for the L. J. Mueller Furnace Company, Milwaukee, Wis.



How to Beat all Competition on Home Air Conditioning Jobs

THE SAME HOLD-HEET PLANOIDAL BLOWER UNIT WITH CONTROLS THAT PROVIDES COMPLETE WINTER AIR CONDITIONING FOR ANY FURNACE HEATED HOME WILL ALSO EFFECTIVELY COOL THE ENTIRE HOUSE IN SUMMER ON THE NIGHT AIR COOLING PRINCIPLE AS DEVELOPED BY THE UNIVERSITY OF ILLINOIS. ONLY HOLD-HEET OFFERS ADEQUATE CAPACITY, LOW COST, NOISELESS EQUIPMENT WITH LIFETIME PERFORMANCE FEATURES FOR THESE JOBS.

WHAT HOME OWNER would buy an ordinary furnace blower when a little more money will buy the superior Hold-Heet Equipment that provides complete Winter Air Conditioning and Summer Cooling of the entire house? Here is equipment that will be used, and it is therefore saleable at all seasons of the year. Go after this business now so that your customers may benefit at once from the wintertime comfort and fuel savings which this unit will effect.

AIR CIRCULATION . . . air-filtering . . . automatic humidity . . . temperature control—summer cooling of the entire house as well—all are provided by this single Hold-Heet unit with controls.



ILLUSTRATION shows the complete assembled unit as shipped with noiseless Planoidal Blower direct-connected to 100-speed, 8-pole Ballentine Capacitor Motor, oversize filters, installation that allows splendid gravity circulation, and new jet and target humidifier. The unit is completely coated with sound-deadening material on all panels. No equipment on the market offers such value, such performance, such features. One of these sales compelling units as a demonstrating unit on your display floor is the most profitable investment you could make to insure profitable volume sales in 1937.

Get the *FACTS* NOW!

The new Hold-Heet Sales, Service, and Installation Manual is just full of facts that will help you make more money than you ever thought possible. There are 37 diagrams, illustrations and photographs of actual installations. Dozens of charts and tables show simple, easy ways to lay out jobs—figure duct areas—select suitable equipment, etc.

FREE
Get your copy
NOW! Use coupon
TODAY

RUSSELL ELECTRIC CO.
Manufacturers
342 West Huron St.
Chicago, U. S. A.

**Russell
Electric
Co.**

342 W. Huron Street
Chicago, Illinois

☐ Send Free Manual No. 986
on Sales, Service and Installation
with all sales Helps.

☐ Send Dealer Price List (Only
Supplied When Your Letterhead
Shows You Are a Regular Heating
Dealer.)

Name

Street Address

City State

Name of Individual

Name of Preferred Jobber

In This Issue

It is physically impossible in this column to give even a brief resume of the many articles in this issue. We can only highlight a few which, in our mind, are outstanding

First the survey of 1936 progress, beginning on page 45. Hundreds of letters were mailed and much midnight oil burned tabulating and weighing the replies. The results are our own—some may not agree—but we stand behind them. Some highly significant trends are indicated.

Something new in patterns is always welcome. Wm. Neubecker begins on page 57, a series to cover all types of fittings used in forced air and air conditioning. Each fitting will be practical, nothing "textbooky," but the kind of patterns you can use in your shop.

There are four articles in this issue covering general business of more than ordinary importance. First is J. G. Dingle's article (page 64) on the taxes you will pay in 1937. If you haven't put your taxes down in black and white—read this article and then list your taxes. Your overhead may bounce upward in a few minutes. Then two articles on home building. 1937 looks like a good year—lots of construction (although much seems likely to be in the low priced group). See pages 53, 60, 70.

Usually a reporter can brief a speaker's address into a few pointed sentences, but the addresses at the December National Warm Air convention were so good that we have spread them out through several years. (Page 165.)

An important architect recently declared—"Thousands of heating men and not one of you can give me a warm floor." In fifteen words that observer threw most of our bag of tricks out of the window. We have been tearing our hair over the means to the end—knowingly or unknowingly. True human comfort is what we claim to sell—but do we give it? Everett S. Buck, on page 99, propounds an idea which well may mark the turning point to the beginning of a new comfort era for this industry.

"Where's That Prospect?" Perhaps you have been asking yourself that very question as the returns from a year of effort have been emerging. More prospects—good prospects—a growing, live list of prospects—is, in the words of R. L. Towne, the lifeblood of every business. A most interesting article on page 103.

And we end this resume with the suggestion that the articles on pages 108 (Konzo); 113 (Bailey); 120 (Fahnestock); 124 (Kroeker); 128 (Pehl), are timely.

AMERICAN ARTISAN

With which is merged

**FURNACES
AND
SHEET METALS**

AND

**Warm-Air
Heating**

Covering All Activities in

Gravity Warm Air Heating Forced Warm Air Heating
Sheet Metal Contracting Ventilating
Air Conditioning

J. D. Wilder, Editor

A. A. Kennedy, Assistant Editor

Brewster S. Beach, Consulting Editor

Vol. 106, No. 1

January, 1937

Founded 1880

CONTENTS

Let's Look at the Record!	45
The Colgate Fleche	50
425,000 New Homes in 1937!	53
Pattern Development for Forced Air Fittings	57
The 1937 "Home Market"	60
Arc Welding Stainless Steel	62
Your Tax Burden for 1937	64
1936 Developments in Metal Buildings	67
Store Modernization Should Be Active in 1937	70
3500 Square Feet of Dead Level Roof	72
The National Warm Air Ass'n Meeting	165
American Artisan 1937 Directory	187
Index to Advertisers	188

THE AIR CONDITIONING SECTION

An Engineering Approach to True Comfort Heating	99
Where's That Prospect?	103
This Price Per Opening Buzz Saw	106
Konzo—Design of F. A. System Using Individual Ducts	108
Time Saving Method for Figuring Heat Loss	113
The Cost of Summer Cooling	120
Air Conditioning in Real Estate Developments	123
Nomograph Chart for Figuring Heating Costs	124
A Low Cost Cooling Installation	128
Study Courses in Heating and Air Conditioning	130

Member of Audit Bureau of Circulations—Member Associated Business Papers, Inc.

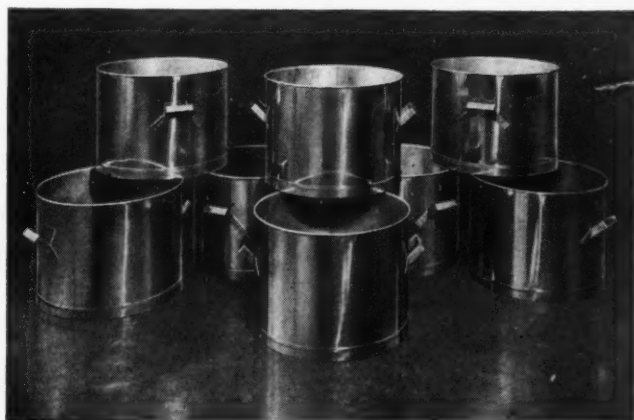
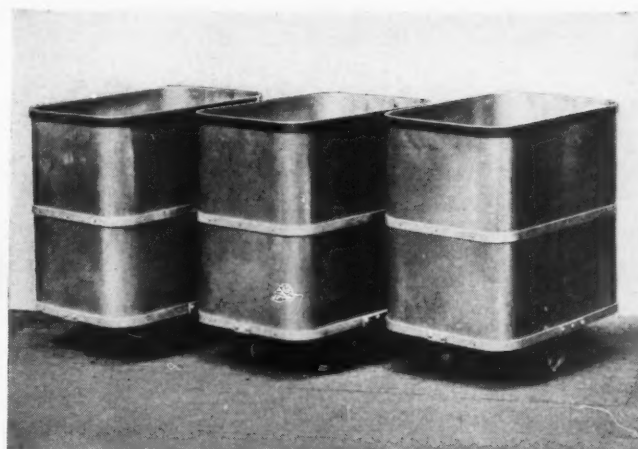
Published monthly by Keeney Publishing Company, 6 North Michigan Ave., Chicago. Branch Offices—In New York, Room 1950, Grand Central Terminal Building, Murray Hill 2-8293; In Cleveland, 2128 Rossmoor Road, Cleveland Heights, Yellowstone 1540; In Los Angeles, J. H. Tinkham, 1406 S. Grand Ave., Richmond 6191. Copyright 1936 by Keeney Publishing Company—F. P. Keeney, President; W. J. Osborn, Vice President; R. Payne Wettstein, Secretary; Chas. E. Price, Treasurer. Advertising staff: Wallace J. Osborn, R. Payne Wettstein, Robert A. Jack, J. H. Tinkham.

Yearly Subscription Price—U. S. and possessions, Canada, Mexico, South America, Central America, \$2.00; Foreign, \$4.00. Single copies, U. S. and possessions, \$.25. Back numbers, \$.50. January, 1936, Directory issue, \$1.00 per copy. Entered as second-class matter, July 29, 1932, at the Post Office at Chicago, Illinois, under the act of March 3, 1879.

How Many

LAUNDRIES...

Laundry—Garment transfer trucks made ibroughout of Monel. Hundreds of such trucks have been in daily service for years. Every laundry is a prospect.



DYEHOUSES...

Textile—Eight of a total order of 48 Monel transfer cans supplied to a prominent textile mill. These Monel cans are 20" dia. x 14" deep x 20 ga. (0.037").

FOOD PLANTS...

...in Your Neighborhood?

Every one of them needs jobs YOU can do... profitable jobs... jobs of MONEL!

EACH of the three jobs shown here made a neat profit for the fabricator who built it. And there's not one of them that you can't do just as well.

WILL do, too . . . as soon as you call on all the plants around you which need Monel* equipment. The men who landed these jobs didn't get them by sitting down and waiting.

You've got an all-round story to tell to help you land these jobs. For Monel is an all-round metal. What your customers want in tanks, trucks, table-tops, trays, and utensils is equipment

that does clean work and that cuts replacement costs by giving long wear.

Make sure they know that Monel does both these essentials: Because it doesn't rust. Because it resists corrosion from most acids and alkalis. And because it has the strength and toughness to stand hard knocks for years.

All that's left to tell them is that you can do an A-1 job of fabricating. By the way, you know Monel can be



Food Processing—Monel tank for the processing of foodstuffs equipped with Monel steam coil. Non-rustable, corrosion resistant, and strong. Monel equipment is long lived and economical.

shaped in all standard ways, including welding and silver-soldering. If you want any tips on the latest wrinkles in fabricating, write us to-day. Then go after those jobs.

THE INTERNATIONAL NICKEL COMPANY, INC.

67 WALL STREET NEW YORK, N. Y.

MONEL

*Monel is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. This alloy is mined, smelted, refined, rolled and marketed solely by International Nickel.



☆ ☆ ☆ ☆

#uni-fin#

WARM AIR REGISTER



A new Register

FIN-TYPE
CHAIN OPERATED

for warm-air heating systems

☆ ☆ ☆ ☆

#uni-fin#

WARM AIR REGISTER

The new four-star ☆☆☆☆ UNI-FIN Warm Air Register is ☆ Good Looking, ☆ Well Made, ☆ Leak Proof (non-streaking), and ☆ Moderately Priced. Thin fins, closely spaced, mask the stack head and keep out toys, pencils, and the like. Quality materials and careful assembly assure durability. Leaks and streaking are prevented by a built-in felt edging strip. Prices are in line with other leading makes of registers. Available in standard and special sizes. Further information will be furnished by any of our representatives, or write us direct.

BARBER-COLMAN COMPANY
ROCKFORD • ILLINOIS

**Ryerson steel stocks include Allegheny
Stainless sheets in a full range of sizes**



**Also more than 25 other kinds of sheets
are in stock for immediate shipment**



**Together with all general Steel Products, such as
Angles, Channels, Bolts, Rivets, Welding Rod, Etc.**

The Ryerson Stock List is your guide to these large stocks of steel and allied products. If you do not have the current copy, write and we will send it.

Joseph T. Ryerson & Son, Inc., Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Philadelphia, Buffalo, Boston, Jersey City

RYERSON

LEADERSHIP

1937

again for

SUNBEAM

offers you

THE COMPLETE LINE

of warm air furnaces and air conditioning units for oil, gas and coal, and for every size, type and price of home.

ATTRACTIVE LOW PRICES

on all models. Increased capacity ratings place Sunbeam Dealers in a better competitive position, than they have enjoyed in the past.

NATIONAL ADVERTISING

to millions of home owners, home buyers, builders, contractors, architects — telling your customers and prospects about Sunbeam advantages.

LOCAL SELLING PROGRAM

which includes actual leads from advertising, reports of new building, follow-up material, selling helps, posters, broadsides and other literature.



SUNBEAM
WARM AIR FURNACES AND
AIR CONDITIONING UNITS

THE FOX FURNACE COMPANY
ELYRIA, OHIO

DIVISION OF AMERICAN RADIATOR
& STANDARD SANITARY CORPORATION

● A
sp
condi
ress -
Sunbe
for th
mark

ON

Backh
Sunbe
condi
and c
home
naces
wareh
and ca
in the
new m
machi
— now
and st

Again
mium
capaci
are the
on the
easier

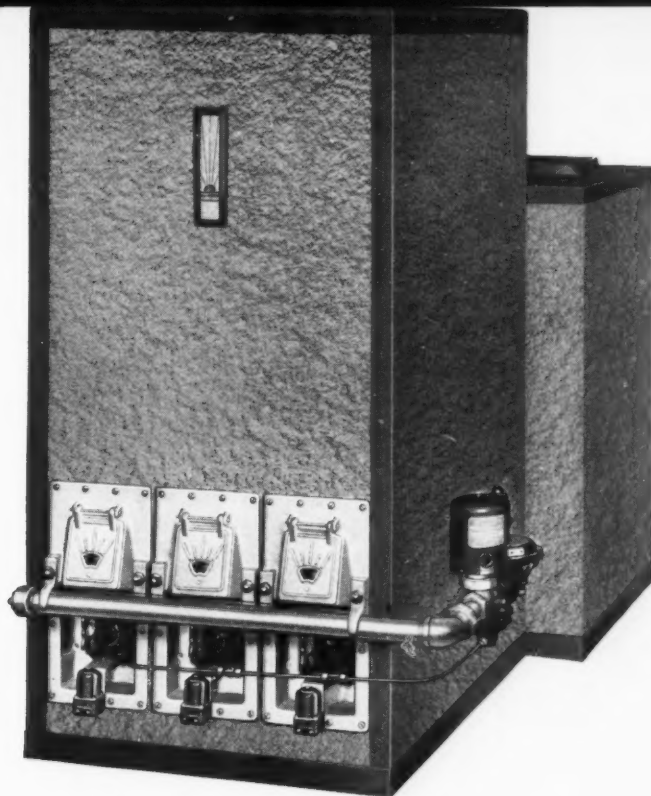
WE

Sunbe
space,
ing pr
the pul
Home
Sunbe
hands
who ar
Sunbe
prospe

The Su
this ye
today a
more b

NEW!... SERIES M GAS-FIRED SUNBEAM AIR CONDITIONING UNIT

This new addition has steel heating elements of an advanced design — and an attractive low price! It is compact and efficient. The cabinet is finished in two-tone green enamel. There are four sizes, ranging from 80,000 to 200,000 B.t.u. input per hour. Send coupon for literature and data.



● Again in 1937, the Sunbeam Program spells *greater profits* for furnace and air conditioning dealers. Four points of progress — plus Sunbeam Leadership — place Sunbeam dealers in a commanding position for the greater possibilities that a growing market offers.

ONE SOURCE OF SUPPLY

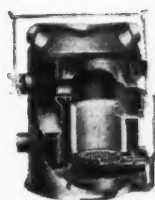
Backbone of the program is the *complete* Sunbeam Line; gravity furnaces and air conditioning units of every type, in steel and cast iron; sizes and models for every home and purse, for oil, gas or coal. Furnaces are ready for immediate delivery from warehouse stocks in 149 cities. Both steel and cast iron heating plants are produced in the large Sunbeam factory. A completely new manufacturing plant — with modern machines and tools fabricating every part — now produces improved steel furnaces and steel heating elements.

Again in 1937, you need not demand a premium in price for Sunbeam quality! Higher capacity ratings on air conditioning units are the equivalent of a reduction in price on these models. Sunbeam Units will be easier to sell this year.

WE'RE TELLING YOUR CUSTOMERS

Sunbeam National Advertising in large-space, dominating advertisements, is reaching prospective buyers in your locality in the publications they read most. Through Home Owners' Catalog we place a large Sunbeam Air Conditioning Book in the hands of individuals in your community who are planning to build new homes. The Sunbeam Program locates and interests prospects for you, right in your locality.

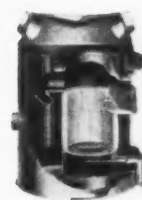
The Sunbeam Franchise is a valuable one, this year and every year. Mail the coupon today and learn how it will help you get more business in 1937.



Steel Furnace
(Series 8000)



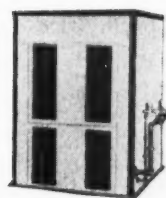
Cast Iron Furnace
(Series 1000)



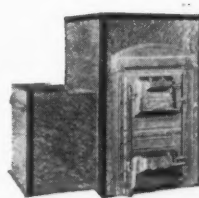
Steel Furnace
(Series 300)



Gravity Furnace
(Cast Iron)



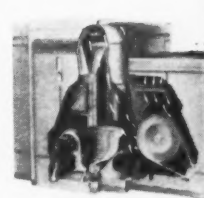
Gas-Fired
Furnace
(Series AF)



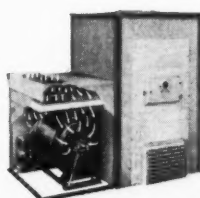
Coal or Oil Burning
Air Conditioning Unit
(Series 34)



Coal-Burning
Air Conditioning Unit
(Series 32)



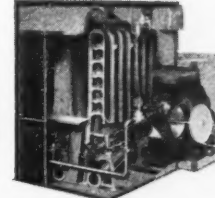
Oil-Fired
Air Conditioning Unit
(Series 140, 160, 400)



Complete with Oil Burner
(Series 725-R-18)
Air Conditioning Unit



No-Basement
(Series 725-R-18)
Air Conditioning Unit



Gas-Fired
Air Conditioning Unit
(Series C)



Gas-Fired
Air Conditioning Unit
(Series 32)

MAIL COUPON

THE FOX FURNACE COMPANY • Elyria, Ohio

- ☐ Send me details of the SUNBEAM PLAN for 1937, and of the complete Sunbeam Line.
- ☐ Send me information on the new GAS FIRED AIR CONDITIONER.

Name _____

Address _____

City _____ State _____

HERE'S THE WAY TO GET MORE *Residential Roofing*



Residence designed by Dwight James Baum, Architect, Riverdale-on-Hudson, New York City.

ANACONDA ECONOMY COPPER ROOFING OFFERS HOMEOWNERS THESE OUTSTANDING ADVANTAGES

- 1. GOOD APPEARANCE**
Copper increases in beauty with age and service.
- 2. DURABILITY**
Permanent in spite of time and weather.
- 3. FIRE-PROOF**
Copper roofs eliminate flying spark hazard . . . earn a low insurance rate.
- 4. LIGHTNING-PROOF**
when properly grounded.
- 5. LIGHT WEIGHT**
makes costly supporting structure unnecessary.
- 6. PROTECTS INSULATION**
from damaging water or moisture.

36182

Anaconda Economy Copper Roofing . . . durable and moderately-priced . . . meets every requirement of homeowners

Everything that homeowners want in roofing . . . durability, moderate cost, good appearance, negligible upkeep, etc. . . . is offered by Anaconda *Economy* Copper Roofing. That is why you can sell it . . . why it offers sheet metal men a new opportunity to get profitable residential roofing business. Read at the right the combination of advantages offered by *no other roofing material* . . . and use these advantages as selling points! Anaconda *Economy* Copper Roofing is carried in stock by leading sheet metal supply houses.

You have the men and the tools to install standing seam roofs. Why not get the business? Send for Publication C-7.

Anaconda Copper

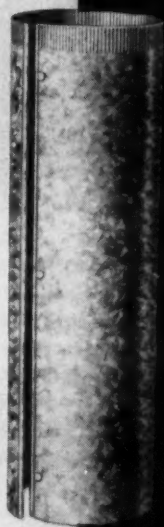


THE AMERICAN BRASS COMPANY, General Offices: WATERBURY, CONNECTICUT
Offices and Agencies in Principal Cities • In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.

F. MEYER & BRO. COMPANY

HANDY PIPE

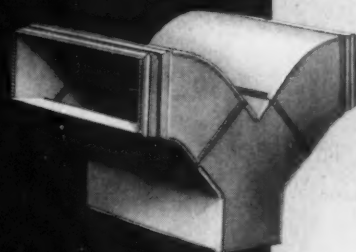
PEORIA, ILLINOIS



PIPE FOR
ALL NEEDS



ULTRA MODERN
DUCT WORK
FOR FORCED AIR
CONDITIONING JOBS



HANDY
PIPE



FURNACE BONNETS



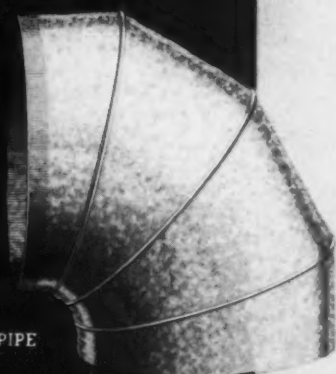
ELBOWS
ALL KINDS
AND SIZES



WALL
STACKS



EVERY SIZE WANTED



COLD AIR PIPE



FRICTIONLESS DESIGN

HANDY PIPE

America's Standard Since
1896 — but constantly im-
proved so that it is as modern
as a China Clipper.

Catalogue Free On Request.
F. MEYER & BRO. CO.
Peoria, Illinois



THE BIG WARM AND AIR LINES THAT HAVE

And when we say "everything" we mean just that. Regardless of whether you are thinking in terms of price, quality, size of job, kind of fuel, appearance, reputation or financial standing of the company you represent, the Weir-Meyer lines have them all. As a Weir-Meyer dealer you will be able to bid for (and get at a profit) the price job or the most intricate and elaborate warm air heating and air conditioning system in the full confidence that you are selling the very best and that it will give the satisfaction you and your customer have a right to expect.



WEIR
"600 Series"
Conditioned
Air Unit



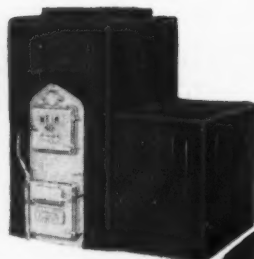
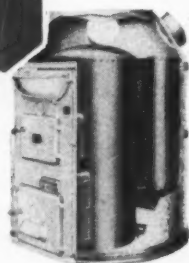
WEIR
Oil Fired Air
Conditioner

WEIR
Room Heater

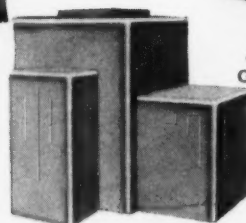


MEYER
"C Series"
Gas Furnace

WEIR
"600 Series"
Furnace



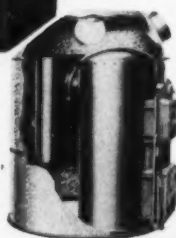
WEIR
"M Series"
Conditioned
Air Unit



WEIR
"K Series"
For Oil

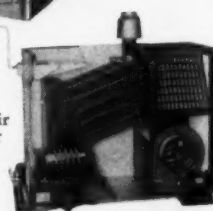


WEIR
"A Series"
Conditioned
Air Unit

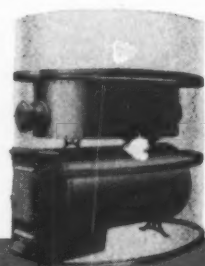
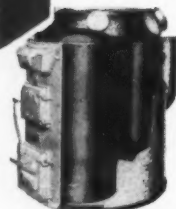


WEIR
"M Series"
Furnace

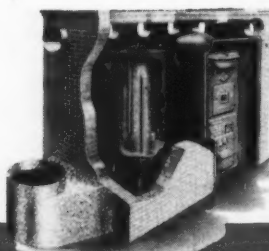
MEYER
Gas Fired Air
Conditioner



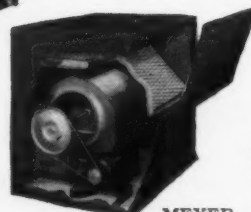
WEIR
"A Series"
Furnace



WEIR
Wood Furnace

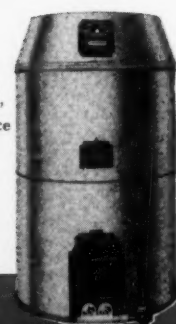


WEIR
Cylindrical
Radiator
Furnace



MEYER
Blo-Aire

MEYER
"D Series"
Gas Furnace



WHO MAKES IT MAKES A DIFFERENCE

AIR HEATING CONDITIONING EVERYTHING FOR



However, what we have to say about the Weir-Meyer lines can hardly be as impressive to you as what other dealers, speaking from their own experience, have to say about this company and its products. The excerpts printed below are from signed letters on file, and the full contents of the originals are available to anyone upon request. But they are merely expressive of the opinions of hundreds of Dealers — they tell how you would feel a year from now after selling the Weir-Meyer lines of heating and air conditioning equipment.

Dealer

"A PLEASED CUSTOMER IS...
OUR BEST ADVERTISEMENT"

...all satisfactory
competition.

I know it to be a fact that most of this business came to me because they knew I sold the Weir. I sold over 90% of my jobs without any other bid. When you get a Weir installed that is the last you hear from it.

The Weir is the best.

to this... it is...

I take this opportunity of expressing our appreciation for the many favors and helps you have given us in the past 32 years.....Perhaps this letter is uncalled for and may sound like our enthusiasm has run away with us, but we do appreciate such friendly business relations.

Furnace

Furnace is

well pleased with our
When I take my prospects out and show them Weir furnaces that have been in service over twenty-five years and that are still satisfactorily heating homes, I can beat cheap competition. The superior quality of your products and the

we would not... other type...
cept that which is made by this company.

I consider it a real privilege to be associated with a Company as fair in their business dealings as the Meyer Furnace Co. Each Weir I sell makes a friend. ...are glad... able to do so... are you going to

Meyer Furnace

I cannot say too much for the Meyer Furnace Co. and their policy of "live and let live", which means a lot between producer and dealer.

There is bound to be a large volume of PROFITABLE business in 1937 for the Dealer who has the RIGHT LINES, backed by the right kind of engineering and the right kind of sales help. Why not LEAD WITH THE LEADING LINES in your community?

Tear Off and Mail the Corner Coupon —

THE MEYER FURNACE COMPANY
PEORIA, ILLINOIS

MAIL THIS COUPON TO-DAY
or simply attach to your letter or bill head.
THE MEYER FURNACE CO., PEORIA, ILL.
Send complete details of the
WEIR-MEYER proposition to

SYPHON-AIR VENTILATORS

*Do A Better Job —
Make You More Money*

The Greatest improvement in ventilators in years!
The wind, blowing thru this ventilator (in at the back and out at the front) sucks or "syphons" the foul air, gases etc. from the room or building below many times faster than an ordinary "gravity" ventilator of the same size.

Correctly designed for a frictionless flow of air and strongly made of ARMCO INGOT iron to render care-free, efficient operation for years. It rotates freely on a bronze ball bearing which will never rust.

Have one on your floor as a display — watch the attention it gets — explain its advanced design to your customers — they'll willingly pay more to have a SYPHON AIR installation.



ANOTHER PROFIT LINE



Radiator Shields

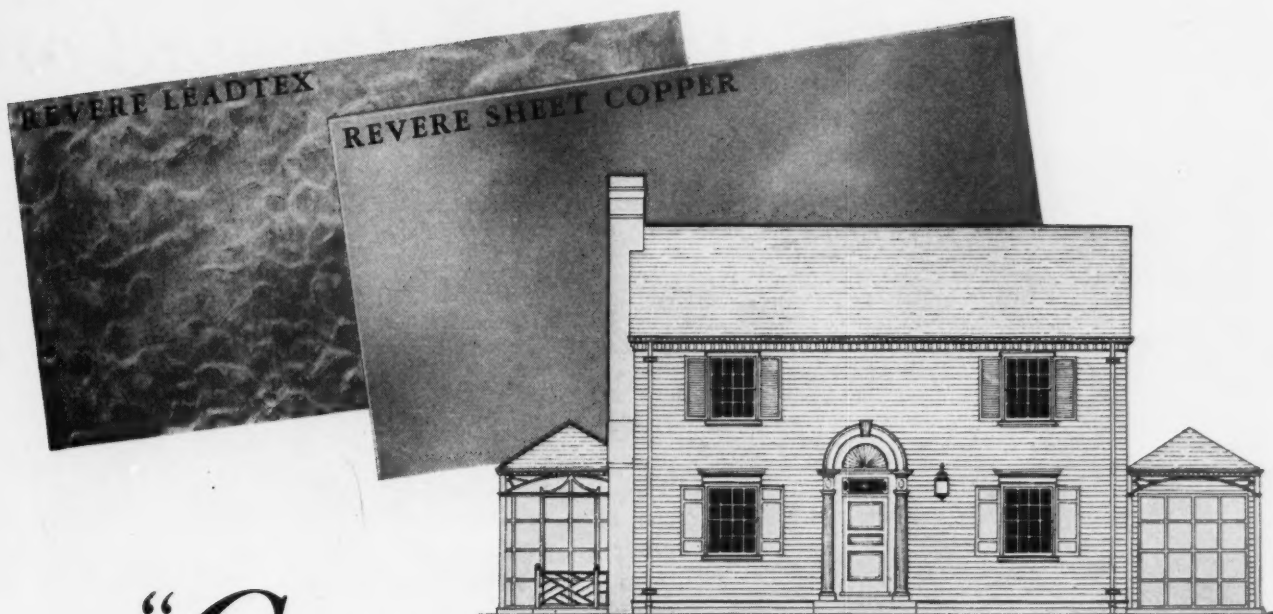
These let you get into and get a profit out of homes that use radiator heat. We have a complete line — including the "Superior" model shown — with hinged cover and a water-pan for convenient humidifying of the air. Sell them to protect walls and draperies.

"THE HANDY PIPE PEOPLE ARE A MIGHTY FINE BUNCH TO TIE TO FOR EVERYTHING NEEDED IN THE INSTALLATION OF WARM AIR FURNACES AND ADVANCED AIR CONDITIONING JOBS IN 1937"! IF YOU HAVEN'T OUR CATALOGS, ASK FOR THEM.

F. MEYER & BRO. COMPANY

PEORIA

ILLINOIS



"Copper-Minded" PEOPLE

ARE SHAPING BUILDING TRENDS TODAY

For more and more details of building protection, architects are specifying COPPER — builders are furnishing COPPER—and the public is demanding COPPER.

This is directly in line with your interests; it helps you to sell your customers.

As a sheet metal contractor, you should be a leader in this movement because (1) it shows that you are progressive, up to date; and attracts to you confidence and business from the courageous, progressive type of people who are going ahead with building and improvements; (2) it helps you to sell the high-grade type of work that promotes good-will; and (3) it tends to increase billings and profits.

The house here illustrated is quite typical of this trend. In one item after another, the specifications call for copper. By way of example, here are a few significant paragraphs quoted from these specifications:

"Directly on top of the cellar walls, and under the wood sill, a 20-oz. lead-coated copper termite stop . . ."

"The cornice gives individuality and is made up of a lead-coated, molded gutter . . ."

"As on the front, the interesting cornice occurs, and the leaders are of lead-coated copper."

"All metal for flashings, flat-decks, leaders and gutters to be 16-oz. copper. Exposed metal to be lead-coated."

Courtesy of Good Housekeeping

Revere Sheet Copper, Revere Leadtex (lead-coated copper), Cheney Flashing (bonds in all directions), and Revere Thru-Wall Flashing (bonds in all lateral directions) are reliable products on which you can standardize with confidence in meeting this trend. Ask your distributor for them. If he cannot supply you, write us direct.

Revere Copper *and* Brass

INCORPORATED

FOUNDED BY
PAUL REVERE



EXECUTIVE OFFICES: 230 PARK AVENUE, NEW YORK CITY • MILLS: BALTIMORE, MD. • TAUNTON, MASS.
NEW BEDFORD, MASS. • ROME, N. Y. • DETROIT, MICH. • CHICAGO, ILL. • SALES OFFICES IN PRINCIPAL CITIES

Why Sheet Metal Men Depend on

NIAGARA MACHINES and TOOLS

for Better Work
and Better Profits



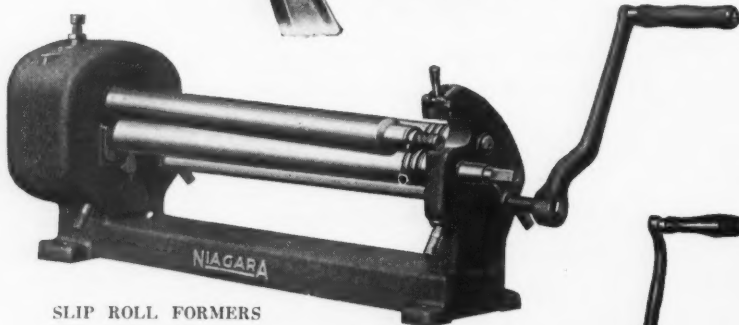
SQUARING SHEARS

Easy Foot Operation. Cutting lengths up to 16 feet. Capacities up to 16 Gage.



No. 164 UNIVERSAL ROTARY COMBINATION MACHINE

with Interchangeable Rolls for burring, turning, wiring, crimping and beading.



SLIP ROLL FORMERS



BAR FOLDERS

Easy, smooth, quick operation, accurate work, ability to handle the new stainless and other alloys,—you get them ALL with the complete Niagara line. There is the right size and type of machine to save time and material on every job.

Write for Catalogs on complete Niagara line.



SINGLE BEAD



SLITTING CUTTERS



TURNING ROLLS



CRIMPING ROLLS

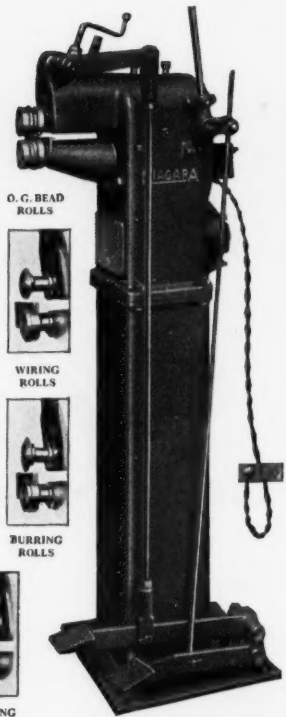
O. G. BEAD ROLLS



WIRING ROLLS



BURRING ROLLS



ELECTRIC COMBINATION MACHINE for fast production.



POWER SQUARING SHEARS

NIAGARA

NIAGARA MACHINE AND TOOL WORKS, BUFFALO, N. Y.
NEW YORK . . . DETROIT

YOUNGSTOWN

POPULAR
because
DEPENDABLE

★It is very easy to assume that all galvanized steel sheets are alike in actual quality because they are so similar in surface appearance. To produce an occasional run of top-quality galvanized sheets is a relatively simple matter. To reproduce that same top quality day after day is a difficult assignment.

★The high popularity of YOUNGSTOWN Galvanized Sheets rests primarily on the way in which YOUNGSTOWN has met and mastered the latter problem. Day after day, week after week, month after month, YOUNGSTOWN Galvanized Sheets run accurately true to rigidly high standards. Because YOUNGSTOWN top-quality is consistent, the use of YOUNGSTOWN Galvanized Sheets is an economy.

**THE YOUNGSTOWN SHEET
AND TUBE COMPANY**

Manufacturers of Carbon and Alloy Steels

General Offices - YOUNGSTOWN, OHIO

**Sheets; Plates; Tubular Products; Conduit; Tin Plate;
Bars; Rods; Wire; Nails; Unions; Tie Plates and Spikes.**

664



Announcing

1 Handle makes moving easy.

2 Rubber-tired casters with novel locking feature.

3 Strong, sheet-steel case provides ample protection.

4 Large switch handle with clear indicating dial assures quick and easy current selection.

5 Handy terminals with wing nuts, for connecting welding leads.

6 Tough-rubber-insulated cord with handy plug for instantly connecting unit to line.

Ask the nearest G-E welding distributor or G-E sales office for more information, or send the coupon below. General Electric, Schenectady, N. Y.

For use with electrodes from 1/16-in. through 5/32-in.



GENERAL ELECTRIC

Dept. 6F-201
General Electric
Schenectady, N. Y.

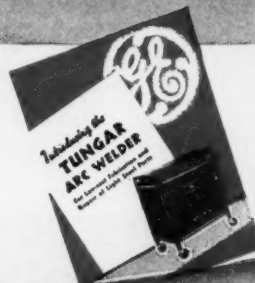
Send me the complete description of the new General Electric light-gauge-metal welder (GEA-2447B)

Name..... Firm.....

Street..... City.....

State.....

140-44A



Send today for the new, attractive booklet describing this up-to-minute low-direct-current welder

BACKED BY

GENERAL

A LOW-COST DIRECT-CURRENT WELDER

for Light-gauge Metals

A "SOFT" ARC—EASY TO USE

The *smooth, continuous* arc of this welder is easy to strike and maintain—users of this welder call the arc "soft." It gives just the *right heat* with just the proper penetration. And there is nothing equal to direct current for very low-current light-gauge welding. Bare as well as coated wire can be used with equal satisfaction with this unit.

IT'S SIMPLE AND STURDY

The heart of this welder is four specially designed mercury Tungar rectifier bulbs. Bulbs are strong, shock-proof, and long-lived, as proved by years of successful operation in rectifying alternating current for battery

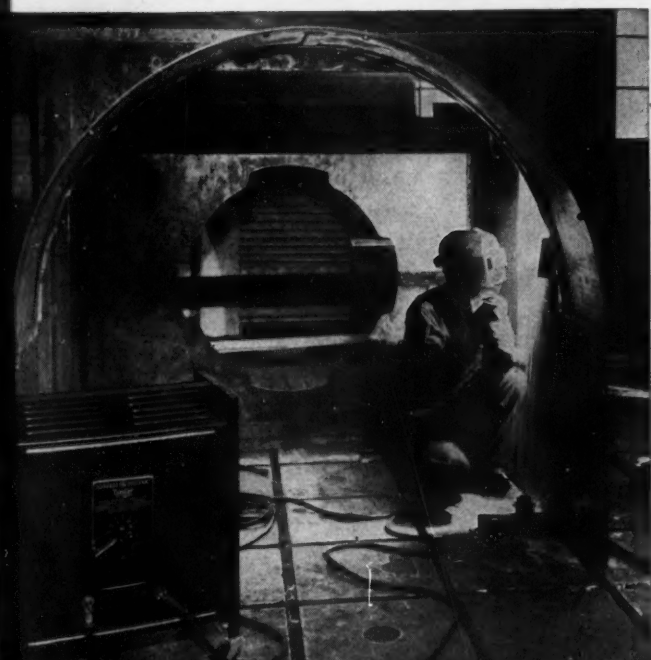
charging. Current control is by means of a handy tap switch which gives a complete range of welding current from 25 amperes to the maximum. The unit is light, and it is mounted on casters for easy moving.

THE WELDING DEVELOPMENT OF THE DECADE

General Electric welding research and engineering have been seeking a low-current welder with no moving parts, that would give all the advantages of light-gauge, direct-current welding—AT A COST SO LOW AS TO PLACE IT WITHIN THE RANGE OF EVERY POSSIBLE USER OF WELDING.

With the development of a mercury Tungar bulb of suitable capacity and proper welding characteristics, the new G-E light-gauge welder advanced from the laboratory to the production line; and now this low-cost welder is ready for outstanding service in your shop.

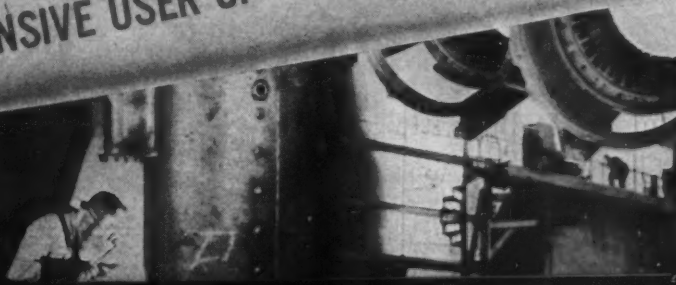
This welder is recommended for art-metal-furniture manufacturing, plumbing shops, ornamental iron works, automobile and trailer-body repair, garages, job-welding shops, and wherever light-gauge metal is fabricated.



for the
tive book
his ap-
u-direct-

ED BY

GENERAL ELECTRIC, THE WORLD'S MOST EXTENSIVE USER OF ARC WELDING



New FEATURES . . . *new* EFFICIENCY

**— YET IT COSTS
NO MORE!**



Now there are eight more practical reasons for insisting on this famous Dial Damper Regulator Set.

Now when you buy the long-famous Parker-Kalon Dial Damper Regulator Sets you get eight new advantages. Four improvements of real worth have been made in the Regulator itself. And four other important superiorities are found in the new Universal Bearings.

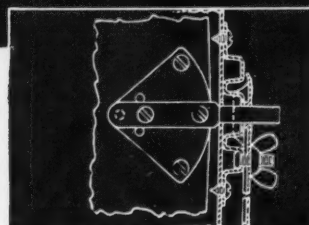
The illustrated details of these new features make it plain that Parker-Kalon Dial Damper Regulator Sets . . . selling at the same price as in the past . . . are the logical choice whenever inexpensive yet highly efficient controls are wanted.

SOLD BY RECOGNIZED DISTRIBUTORS

—in two Sets: No. 14 for dampers up to 10", and No. 19 for dampers up to 20". Sets include Regulator, Bearings and all fastening devices. Regulators and Bearings are also sold separately. Send for new descriptive folder.

**Products of
PARKER-KALON**

190 Varick Street, New York, N. Y.



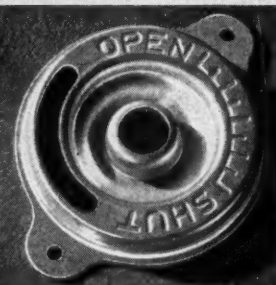
HEATER — STRONGER

SUITED TO ALL DUCT SHAPES

The one piece heavy gauge steel frame is extra strong. The shape permits installation in any required position on either rectangular or round ducts. Markings on face of frame are large and clearly defined to show position of damper at a glance.

PREVENTS AIR LEAKAGE

This cross section shows how the unique, one-piece frame construction seals the opening in the duct to prevent leakage of air . . . promoting efficient operation of the system.



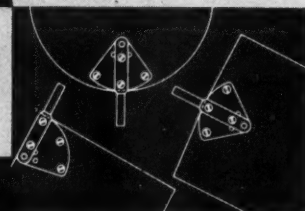
EASILY OPERATED

Free and easy operation of the Regulator is assured by the flanged construction of the lever which rotates upon the hub of the frame. Another feature is the extruded lever opening which provides ample contact for Bearing or rod, eliminating damper rattle.



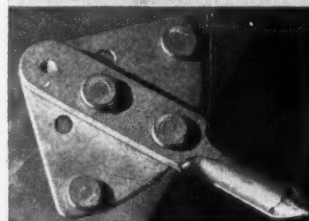
ADAPTABLE TO ANY DAMPER

The Bearing is adjustable on its mounting plate, making Universal Damper Bearings equally satisfactory for regular or splitter dampers.



REINFORCES DAMPER . . . EASY TO INSTALL IN DUCT

Cold-forged from steel, these Bearings will not bend and cannot break. The steel mounting plate reinforces the damper and prevents buckling. Another feature is the point on the round-end Bearing which makes it easy to insert in duct.



Cadmium plating protects both Regulator and Bearings from rust



Time to say . . . **THANK YOU**

Snow and winter are here again . . . the busy season is about over. As we pause to get ready for an even better year, we acknowledge our debt to our many friends for the success which their loyalty and confidence have made possible.

OSBORN'S growth has kept pace with that of the sheet metal industry for three-quarters of

a century. Starting small, we . . . and many of our customers . . . have grown large through the mutual good-will which has existed between us.

We value these friendships . . . this co-operation . . . above all else and will do everything possible to continue to merit them. This is our pledge to you for 1937.

A DEPENDABLE SOURCE OF SUPPLY FOR 79 YEARS

PRIME METAL SHEETS
EAVES TROUGH, GUTTER, ETC.
ROOFING, PAINT, SUPPLIES

THE J. M. & L. A.
OSBORN Co
Manufacturers—Distributors
BUFFALO—CLEVELAND—DETROIT
Metals and Metal Products

WARM AIR FURNACES
WINTER AIR CONDITIONING SYSTEMS
SHEET METAL TOOLS

What people already know about Niagara Gravity Furnaces and Air-Conditioning Units has won their confidence and respect. Niagara dealers share this confidence and respect. When you identify yourself with the Niagara line, you increase your standing as a furnace dealer and mechanic among the homeowners in your neighborhood—you set yourself apart as a better-than-average contractor. Niagara's reputation enlarges your reputation!

Associate with the "last word" in heating appliances and you just naturally will make more installations and greater profits. We will help you get a good start. Just let us know you're interested.

THE FOREST CITY FOUNDRIES COMPANY

2500 West 27th Street

•

Cleveland, Ohio



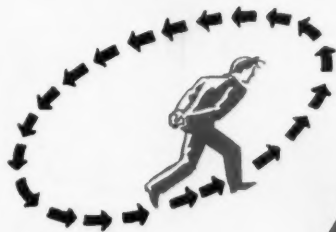
NIAGARA

**COAL, GAS and OIL-FIRED
WARM AIR FURNACES and
AIR-CONDITIONING UNITS.**

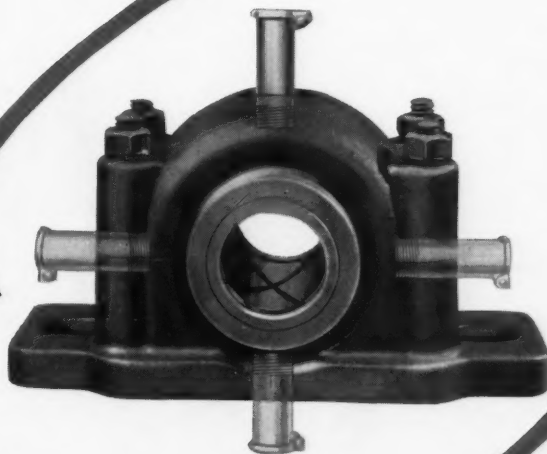
Handall D.
on jobs
under he
quired of
has large c
shown in
the right.

GOOD NEWS

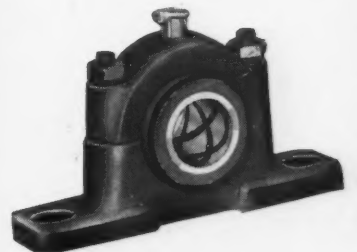
for the man with
BEARING WORRIES



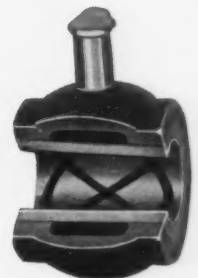
Randall



At left, Randall's Universal Pillow Block designed so that shaft can be mounted in any position. One stock of pillow blocks will accommodate all types of mountings as, for instance, might occur on various assemblies of unit heaters. Below is cut-away section of the ball used in the Universal, showing Double Reservoir Oil Return feature.



Randall Standard Pillow Block. This is the old reliable pillow block which is the fastest selling sleeve-type on the market. Cut-away section below shows how oil feeds through graphite plugs to graphite grooves. Graphite and oil assure continuous lubrication.



For thirty years Randall has been solving bearing problems with the most efficient and dependable sleeve-type bearings. Now, Randall announces important new additions to its line of patented pillow blocks that prevent trouble with many installations heretofore difficult to mount.

Most versatile is the "Universal" which allows mounting in any of four positions by merely removing the oil cup, turning the ball and re-inserting.

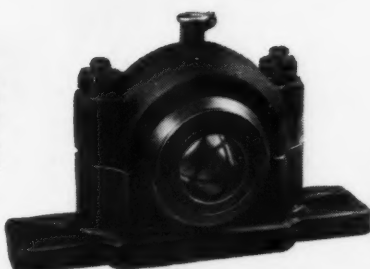
If you have new equipment on your designers' boards or have had bearing troubles in the field, you will want to get Randall's new catalog of pillow blocks. Write today . . . there is no obligation.

RANDALL GRAPHITE PRODUCTS CORP.

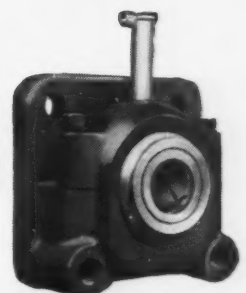
Dept. J, 609 W. Lake Street

Chicago, Ill.

Randall D. R. O. R. Pillow Block for use on jobs operating at higher speeds or under heavier loads than would be required of Standard Pillow Blocks. Has large capacity double oil reservoir as shown in the cut-away section at the right.



Randall Flange Pillow Block for side mounting. This unit also has D. R. O. R. (Double Reservoir Oil Return) feature as shown in the cut-away section at the left. Designed especially for such mountings as sometimes are required on unit heaters.



Twice as
easy

TO GET
REPAIR PARTS

Yes Sir: Fifty-Four Years of experience in furnishing Boiler, Furnace and Stove Repair Parts, together with one of the Largest Stocks, makes it twice as easy for you to get REPAIR PARTS, and reduces shipping time and expense to the minimum.

Thousands of Dealers throughout the country are now ordering their needs from BRAUER, for they are assured of many Original Parts . . . of Dependable Quality always . . . of the Speediest Service . . . and every part is guaranteed to fit or your money is refunded.

Distributors of

AIR CONDITIONING, HEATING EQUIPMENT AND SUPPLIES



A. G. BRAUER SUPPLY CO.

316 North Third St. • St. Louis, Mo.



New improved design makes this Griswold new American Damper better than ever

NOT satisfied even with the best, Griswold engineers have found a way to make Griswold dampers even better than ever, with a new improved design. That's the American Way of Progress.

Exclusive new features make the new Griswold Damper easiest to install . . . both time and trouble saving. Any good stove or furnace man knows it pays to buy the best, because the best is cheapest in the long run. That's why they insist on America's most

popular, most reliable and fastest selling damper. They find that a very *small* difference in price means a very *great* difference in quality and satisfaction.

WRITE TODAY for further details and prices about the world's most complete line of dampers. Regular size 3" to 7". Furnace, 8" to 18". Oval, 4" to 8". Advance orders indicate a busy season ahead, so plan to order your season's requirements early.

THE GRISWOLD MFG. CO., Erie, Pa.



NEW AMERICAN
The Original Steel Spindle
REVERSIBLE DAMPER

**AMAZING NEW FEATURES
FOR EASIER INSTALLATION**

- 1 New improved design with hump on spindle that goes straight through pipe before spindle point enters opposite side of pipe. (No need to put hand inside of stove pipe while installing).
- 2 Improved spindle slips easily and freely through improved reversible plate.
- 3 A twist of the wrist and the hump on spindle drops into notch, insuring a positive lock.
- 4 Patented hump guide on plate leads spindle hump into locking position without fail.
- 5 New design reversible plate allows one-piece, non-breakable steel spindle to be easily inserted from either side.
- 6 Size marked on both sides of plates, for added convenience to user.
- 7 Sharp point of spindle pierces any ordinary stove pipe, leaving a clean hole same size as spindle.
- 8 New improved full tension spring with nickel finished ferrules, not affected by heat.
- 9 Ferrules and spring do not fall off spindle while assembling . . . a useful time-and-temper-saving feature.



H. P. Mueller (right) and chief engineer E. A. Jones discuss design of new unit with a member of Mueller's engineering department.

IT PAYS TO BE ALERT

WHILE I was still young enough to think that running a business was easy, my father impressed me with this simple fact—"Times change but human nature is always the same."

It took me a long time to figure that out. Sometimes people confuse changing times with a change in human nature. That's a mistake. It's human nature to reach up for something better. It's human to want improvement. That's what makes times change. As human beings get used to their clothes, their motor cars, their heating systems, they want improvements—they become restless for change. It pays to be alert to these human wants. The man or manufacturer who can sense the public desire for change is prepared to profit and improve his position by supplying the products the public wants.

For 80 years it has been a policy of the Mueller Furnace Company to be alert to people's changing wants. It has brought us from the filigreed stove through the pioneering of automatic heat and air conditioning.

Again alert to the changing public wants, we take pride in offering our improved line of Mueller heating and air conditioning equipment for 1937. The public, long under buying restraint, is about to go on a spending spree—and according to economists, most of the money will be spent to improve the home.

This is your chance to reap the rich rewards that come to those alert men who take the tide at flood.

Look over the Mueller heating and air conditioning equipment which has been improved to meet present day demands. Be ready to cash in on the demands in your city. Join the ranks of those alert men who will be among the first to profit by the return of prosperity.

Write today for the Mueller proposition.

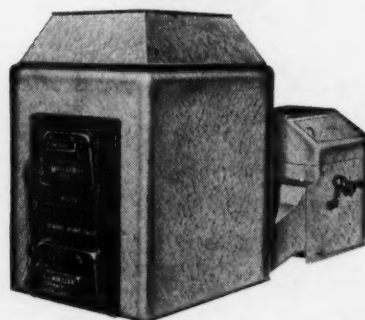
H. P. Mueller
President.

MUELLER

EVER alert to changing public trends Mueller proudly presents its improved line of heating equipment for 1937. Crinkle finish lacquer, which proved so popular on our deluxe models last year, will be standard on most 1937 equipment.

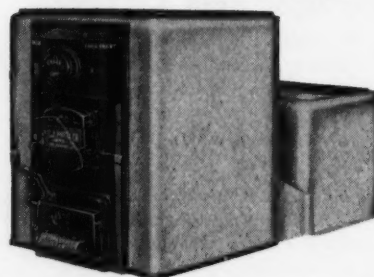
Look over the new and improved models on these pages. See the new Mueller catalog which describes the entire Mueller line in detail.

STEEL FURNACE WITH CLIMATOR



This square cased Mueller Steel Furnace with Climator III attached is ideally suited to either coal or oil. The square casing finished in Mueller's new velvet green crinkle lacquer gives a modern attractive appearance. The Steel Furnace is also available with standard round casing. Climator III is an all-in-one winter air conditioner which may be installed in conjunction with any warm air furnace. Make this unit the source of new business in your repair and modernizing jobs where cost is a factor.

MUELLER FULL FRONT



Long the standard of coal fired furnaces, the Mueller Full Front has earned a fine reputation for depend-

M U E L L E R

PRESENTS ITS 1937 PRODUCTS

ability and economy. Radiators are streamlined in one piece with cleanout openings extending through the casing and shield. Get all the facts about this popular furnace. Sell it as a profit maker and good will builder for you.

The illustration shows the Full Front with square casing in velvet green crinkle lacquer finish. Climator IV is connected. This is an excellent installation for coal or oil fired jobs. The Full Front is also available in standard round, galvanized casing.

MUELLER GAS ERA CAST IRON FURNACE



When you sell a gas job, here is the furnace to rely on. The Mueller Gas-Era-all-cast-iron furnace has won a fine reputation for safety, dependability and low fuel consumption.

The modern casing in velvet green crinkle lacquer is trimmed with chromium and black. Manifold, cleanout, burner doors, etc., are hidden from view by perforated grilles—yet are readily accessible. Grilles are easily removed and front panel can be taken off by unscrewing a few bolts.

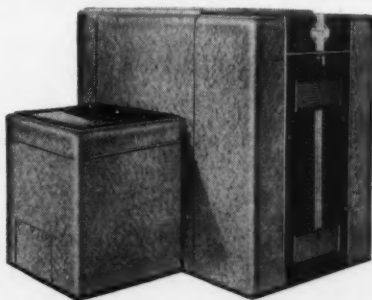
The Mueller Gas Era Cast Iron Furnace is precision built from start to finish. It is sure to please your gas customers.

SERIES TWENTY AIR CONDITIONING OIL FURNACE

The Series Twenty is a recent Mueller achievement scoring triumphs wherever people want a compact, efficient automatic heating and air con-

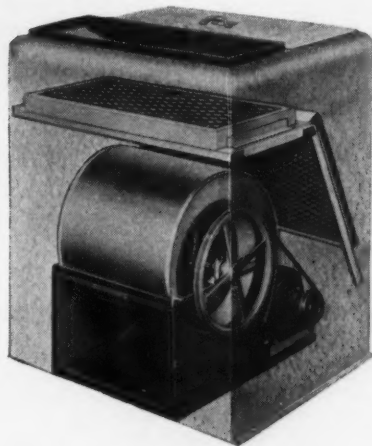
ditioning unit at a price the "little fellow" can afford.

This unit supplies completely automatic heat plus filtered, humidified and



circulated air. The Series Twenty is supplied without oil burner. Practically any gun type burner may be used.

Casing is finished in velvet green crinkle lacquer with black and chromium trim. Be sure to get acquainted with this unit. It can make real money for you.



CLIMATOR V

This popular-priced fan and filter unit meets a growing demand among those folks who now have a good furnace but want to enjoy the advantages of filtered-forced air circulation.

Learn about this sales-getting unit. Climator V is furnished complete with filters, multiblade fan and long-hour duty motor. Housing supplied in gray crinkle lacquer. Can be finished to match the installation. Ask about other models of Climator to fit varying installations.

THE SERIES "O" AIR CONDITIONING OIL FURNACE

This remarkable self-contained oil-fired air conditioning unit marks the first distinct departure from conventional furnace design in a direct-fired, forced air heating and air conditioning plant.



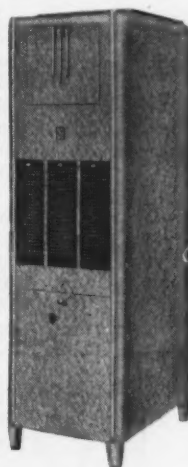
The basic design of this Mueller unit, covered by patent claims allowed and pending, secures a new standard of efficiency and reduced fuel cost.

The Series "O" heats, humidifies, filters and circulates the air within the home. Specialize on this unit for profitable business and satisfied customers.

MUELLERAIRE UNIT HEATER

Here is a unit that finds ready sale to stores, shops, show-rooms, small factories and such commercial applications where the unit is to be installed within the space to be heated.

The Muelleraire heats, filters and humidifies the air and distributes it by forced circulation. Heat transfer units are Gas Era pressed steel sections. Readily installed. Simply connect gas, water, electricity and vent, and attach cowl or duct.



Write today for Mueller catalog. AA-1.

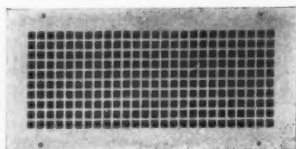
L. J. MUELLER FURNACE CO.
Milwaukee, Wis.

M I L W A U K E E

For 1937 **H&C** Presents

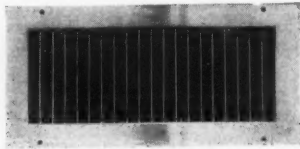
A Most Comprehensive Line of AIR CONDITIONING GRILLES and REGISTERS

8 OUTSTANDING DESIGNS



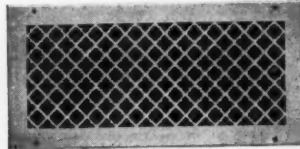
NO. 71 DESIGN †

A low-priced attractive grille. Small openings ($\frac{3}{8}$ "") afford excellent concealment of duct—improve appearance. Price Group A



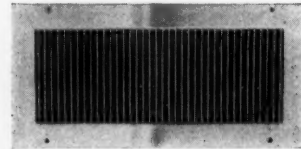
NO. 72 DESIGN †

Combines bar type construction, neat appearance, unusually large free area with low cost. Depth of bars is $\frac{3}{8}$ ". Price Group A



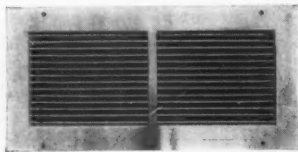
NO. 76 DESIGN

Inexpensive—A favorite with many because of its attractive appearance which harmonizes with any interior. Price Group B



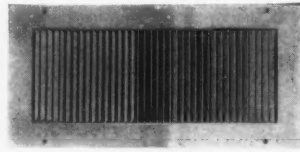
NO. 77 DESIGN †

Made up of bars $\frac{3}{8}$ " in depth spaced $\frac{3}{8}$ " apart. Affords neat appearance, effective concealment of duct at very modest cost. Price Group B



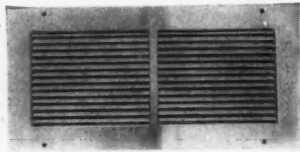
NO. 78 DESIGN †

Similar construction to No. 77 except bars are horizontal. Center mullion further enhances appearance. Price Group B



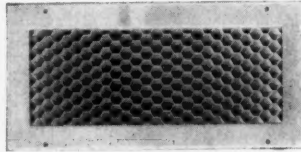
***NO. 84 DESIGN †**

Adjustable bar type. Provides, easily and quickly any deflection or combination of deflection desired. Price Group D



***NO. 85 DESIGN †**

Similar in construction to No. 84. Downward adjustment of the bars when located near the ceiling avoids streaked ceilings. Price Group D



NO. 90 DESIGN

Recognized as the ACE of A. C. Grilles. Gives dual control of air-flow. Depth and curved tubes reduce noise, turbulence, resistance to minimum. Price Group E

† New item—Ready in January.

IN 4 PRICE GROUPS

The four price groups in which H & C grilles are offered, together with the latitude afforded in the selection of frames, permit unprecedented flexibility in meeting the exact requirements of every installation. By all means use this great line in 1937; and be sure to ask your jobber for a copy of the new H & C No. 37 Complete Catalog, just off the press.

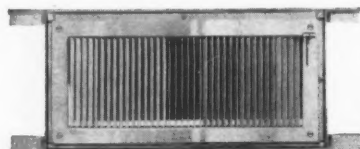
SECTIONAL ADJUSTMENT

*Bars are adjusted in 2" sections by means of key provided. Hence in even a 10" grille as many as 5 different deflections may be made.

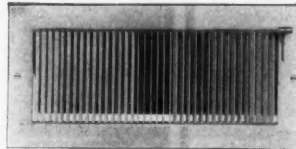
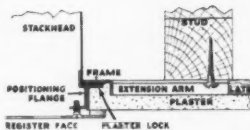


ALL AVAILABLE with 1 or 3-PIECE FRAMES

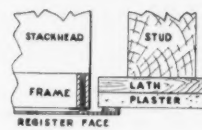
FOR SIDEWALL OR BASEBOARD INSTALLATION — INTAKES TO MATCH



**3-PIECE SIDEWALL TYPE WITH
NO. 84 DESIGN**



**1-PIECE SIDEWALL TYPE WITH
NO. 84 DESIGN**

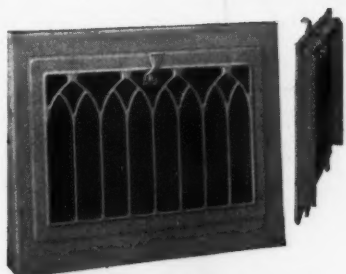


HART & COOLEY MANUFACTURING CO.

Warm Air Registers
Regulator Sets **H&C** Air Conditioning Grilles
Dampers • Chain
61 W. KINZIE ST. CHICAGO • ILLINOIS

In Canada: Fort Erie N., Ontario

Representative of the High Quality of the **H&C** GRAVITY LINE



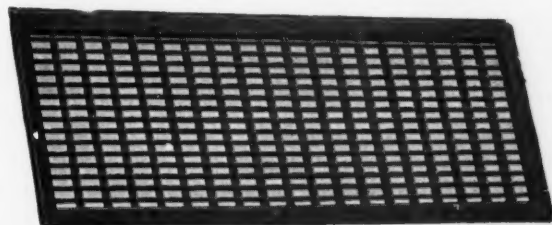
H & C No. 120 Baseboard Register

Combines an unusually attractive face design with exceptionally large free area, quickly detachable face, and valve operating mechanism with extremely smooth action. Made to be installed with stackhead overlapping the frame.



H & C No. 210 Floor Register

Standard mesh is 7/16" by 1-7/16" which eliminates the possibility of heels catching in mesh, provides better walking surface, and effectively conceals the duct. Strong and very rigid. Exceptionally well built as evidenced by the perfect alignment of members and invisible corner joints.

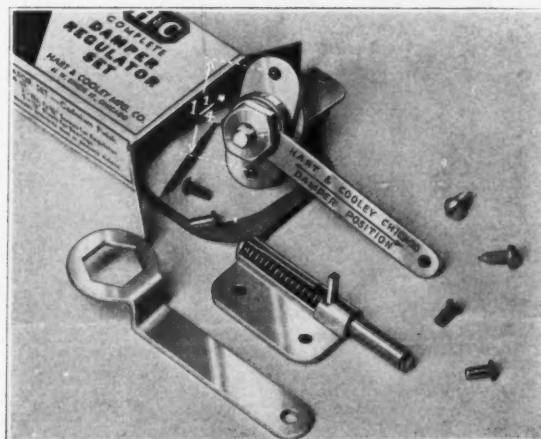


H & C 265 Return Air Face

Matches in appearance and general construction the H & C No. 210 Floor Register. Mesh openings are 11/16" x 1-7/16". A very sturdy Return Air Face possessing exceptionally large free area. Nos. 265 and 210 are both very popular in medium dark oak finish.

The three registers shown on this page, though only a very small portion of the H & C gravity line, typify the sound construction, attractive design and all around quality that have made H & C America's No. 1 Register line—first choice of alert installers and jobbers throughout the country. Thoroughly complete, it offers an ideal register for every type of installation—one that will constantly suggest to your customer a quality installation. Use this great line to build the most valuable asset in business—a quality reputation.

The New 1937 **H&C** DAMPER REGULATOR SETS



We are confident these new Damper Regulator Sets will appeal to you. *That's why we say— TRY THEM AT OUR RISK*

SUPERIORITIES:

Bearings of steel—may be used for either splitter or regular dampers. Design and construction eliminate vibration, permit installation in any position and close to the edge of duct. Installation can easily be made tamper proof. Bracket is die-cast and all other parts cadmium plated to prevent rust. 1/4" set is furnished with snap bearing so even the smallest dampers may be installed without bending. These and other features will convince you of the wisdom of standardizing on the new H & C Damper Regulator Sets.

WRITE TODAY FOR SAMPLE.

HART & COOLEY MANUFACTURING CO.

Warm Air Registers **H&C** Air Conditioning Grilles
Regulator Sets Dampers • Chain

61 W. KINZIE ST. CHICAGO • ILLINOIS

In Canada: Fort Erie N., Ontario

B E W I S E — H A N D L E W I S E !



ALL EYES on WISE for 1937

.... and why not? The dependability, economy and performance that characterize Wise Furnaces have long been by-words with the nation's foremost heating men.

NOW for 1937—Wise presents an improved Master Model Series A. A check of the following exclusive features will prove beyond a doubt that the countersign to more furnace sales and increased trade will be "All eyes on Wise for 1937."

- **NEW ONE-PIECE SELF CLEANING RADIATOR**

A new one-piece self-cleaning radiator—provides larger combustion chamber and more prime heating surface . . . and will not fill up with soot and dirt.

- **NEW ASHPIT AND LOWER FRONT**
—in one piece eliminates joints, makes installations easier and assures permanent, perfect alignment of fronts.

- **ONE-PIECE CELLULAR FIRE-POT**

One-piece cellular fire-pot—proved by University tests to be at least 9

per cent more efficient than the solid type.

- **PERMANENT DOMESTIC HOT WATER SUPPLY**

Assures a permanent domestic hot water supply (available at slight extra cost).

- **ONE-PIECE SQUARE BASE AND ENAMELED SQUARE CASING FOR AIR CONDITIONING USE**

Wise Furnaces have earned first rank reputations in past heating seasons and the Master Model Series A bids fair to protect that reputation for many years to come.

Now that you've definitely turned your eyes to Wise
—pick up that pen or pencil and write us for the
complete details.

WISE FURNACE CO. AKRON, OHIO



YOU'RE ON THE AIR - with ARMCO!



Armco is back on the national air-waves again—this time with an NBC coast-to-coast show featuring the famous Armco Band, the Ironmaster, and a novel dramatic sketch. Yet as enjoyable as these broadcasts are, remember they are especially designed to help you sell more sheet metal work done with Armco Ingot Iron—the metal known to millions!

This is your show—provided for your merchandising benefit. Listeners hear about Armco Ingot Iron as well as other Armco products. They learn and appreciate the many advantages that go with the Armco triangle trade-

mark. The result is easier sales and a greater margin of profit when you work with Armco sheets and formed products, and let your customers know it.

Listen to these broadcasts every Tuesday night and urge your customers to do the same. Ask the nearby Armco distributor for complete details on this as well as the other valuable business-promoting services he offers. And be sure to call him for quick delivery on Armco Ingot Iron, stainless steels and plain or copper-bearing steel sheets made by The American Rolling Mill Co., Middletown, O.



LISTEN TO ARMCO ON THESE STATIONS



WBAL..1060 WHAM..1150
 WBZA..990 • WEBR..1310 • WFIL..560
 WGAR..1450 • WJZ..760 • WSYR..570
 WBZ..990 • WMAL..630 • WLW..700
 WIRE..1400 • WXYZ..1240 • WENR..870
 KDKA..980 • KWK..1350 • KOIL..1260
 WMT..600 • WREN..1220 • KVOD..920
 KLO..1400 • KECA..1430 • KFSD..600
 KGO..790 KJR..970 KGA..1470 KSO..1430

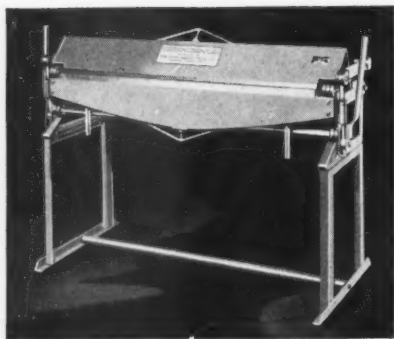
ARMCO SHEET METALS

CALL THE ARMCO DISTRIBUTOR—TODAY

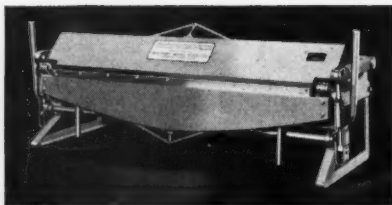
WHITNEY METAL TOOL COMPANY

ROCKFORD *Since 1910* ILLINOIS

Whitney-JENSEN
PORTABLE BENDING BRAKE



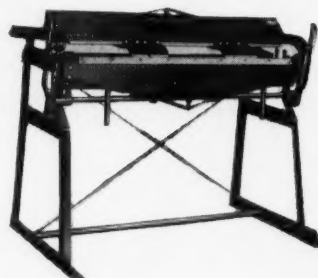
A light, 4 foot, 20-gauge bending brake at a very low price. Ideal for duct fabrication and similar work. Floor type shown.



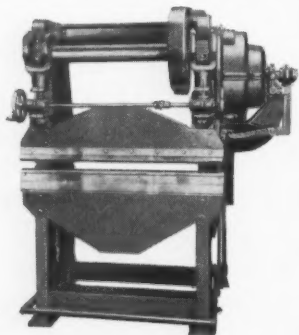
"AIR CONDITIONING SPECIAL"

Bench type shown. Designed to meet a widespread demand. Weighs only 265 lbs., yet has nearly every feature of a larger machine. With this "special," air conditioning and warm air heating ducts can be easily fabricated on the job.

Whitney-JENSEN
PORTABLE COMBINATION
BRAKE



Same as machines shown at the left, but with the addition of removable fingers for box and pan bending as well as straight bending.



Whitney-JENSEN
PRESS BRAKE

Capacity, 50 in. length, 14 ga. thickness, right angle bend in mild steel. A powerful, accurate, durable machine for moderate size work. Many exclusive features.

1936 Developments NEW MACHINES... NEW TOOLS...

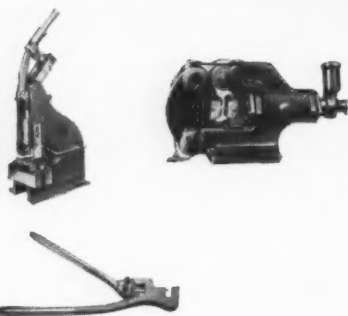
During the past year we have added to our line the products shown here. We have designed them with the user in mind, and, on the basis of twenty-five years experience, have included every feature we know of to insure strength, durability, and accuracy. See your dealer for further information.

**We are always
Looking Ahead!**

Whitney-JENSEN
ABRASIVE
CUT-OFF
MACHINE



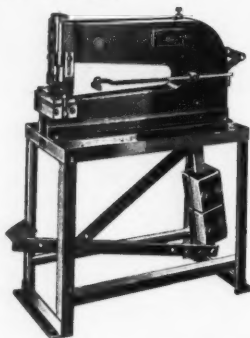
Universal angle vise and pivoted wheel head permits cutting at any predetermined simple or compound angle. Suitable for all kinds of tubing, shapes, hard and soft metals, stone, plastics, etc.



A Few
SPECIAL TOOLS

We are constantly working on the design of special tools made to order for specific purposes. Top right is a coupling sleeve press for power lines. Bottom left is a clip punch for assembling acoustic ceiling framework.

DEEP-THROAT
FOOT PRESS



This latest addition to our line of Foot Presses offers full 24-in. clearance in the throat. Capacity 2 in. hole through 16 gauge.



NOTCHER

Features include full opening in die, and a new double-duty depth gauge. Capacity, 13/16-in. deep notch in 20 gauge metal.



CLIP PUNCH

For fast assembly of duct work. Punches triangular clip with three-way lock. Capacity 16 gauge (two thicknesses).

"THE TOOLS YOU NEED TODAY"

"THE Grand Prize LINE"



"Home Comfort" the Grand Prize Line has indeed proven itself to be a grand prize to the dealers who have handled it thru the years. Its completeness makes it a most profitable one, for it includes furnaces of all types and kinds that are priced to meet every purse.

Their efficiency in operation, and therefore, the fuel economies they effect, are overshadowed only by their ability to withstand many years of service. In selling a "Home Comfort" installation both you and your customer will be well pleased with its performance. Installation is simple—some of the models requiring as little as four screws for assembly.

Add all the features together... simple installation... fuel economy... long lasting efficiency... complete line... right prices... you must find the total to be greater sales and greater profits. Line up with "Home Comfort" for 1937 and get that grand prize of extra profits. WRITE FOR THIS LITERATURE NOW!

Stood the test for more than half a century

Featuring Four Screw casing Assembly

Really noiseless and effective

Built for the purpose

The cast furnace at a price

The Zenith of Modern Heating Efficiency

The "inclusive" Air Conditioning Unit

"Home Comfort"
FURNACES

★
**DUR-A-BLE
FURNACE**

"Home Comfort"
Blowers

"Home Comfort"
**Oil
Fired**

"SURETY"
Line

"Home Comfort"
**GAS
FIRED
FURNACE**

"Home Comfort"
**ALL IN ONE
Contrallaire**

• • "HOME COMFORT" FURNACE & MFG. CO. • • •
2901-11 Elliot Ave., ST. LOUIS, MO.

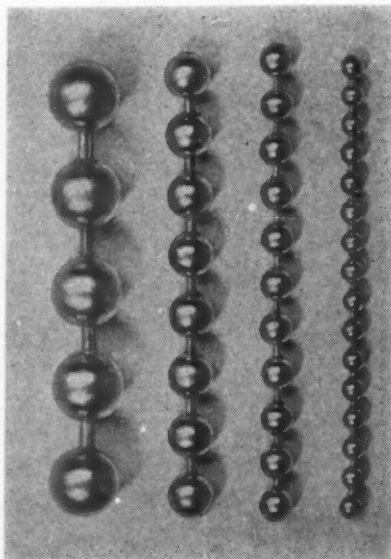
Send me the following literature:

Name Firm Name

Address City and State

☐ Home Comfort steel furnace ☐ Durable ☐ Blowers ☐ Oil Fired ☐ "Surety Line" ☐ Gas Fired ☐ Contrallaire

BEAD CHAIN*



No. 20 BEAD CHAIN No. 13 BEAD CHAIN No. 10 BEAD CHAIN No. 6 BEAD CHAIN

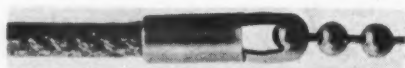
Illustrations Actual Size
Samples on Request

Size No.	Dia. of Bead in Inches	Approx. Tensile Strength in pounds
6	.125	25-30
10	.187	45-50
13	.250	85-100
20	.375	175-200

MATERIALS

Brass, Bronze, Gilding Metal, Nickel Silver, Aluminum; Chromium, Nickel, Gold and Silver Plate. Standard attachments as shown, or made to customers' specifications.

...



NEW CHAIN AND CORD COUPLING

This new coupling, No. 10-V, makes a firm connection between BEAD CHAIN and Venetian blind cord. It is easily applied. For No. 10 BEAD CHAIN only.

*Trade Mark Reg. U. S. Pat. Off.

The non-kinking and swiveling characteristics of BEAD CHAIN* make it advantageous for use in regulator adjustments.

BEAD CHAIN* adds but little to the cost of any heating or ventilating unit and greatly improves the appearance and operation of the finished job.

BEAD CHAIN* is adapted to sprockets that have been designed for the automatic regulation of dampers and ventilators, that work smoothly and efficiently.

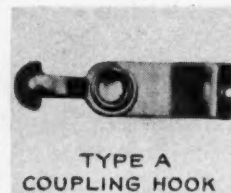
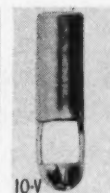
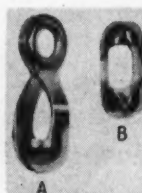
BEAD CHAIN* may be had in bulk and cut lengths, with couplings and attachments, or in assemblies to meet the specifications of the manufacturer.

BEAD CHAIN* engineering service is prepared to co-operate fully with manufacturers in the design of assemblies where the use of chain is necessary or desirable.

DETACHABLE PENDANTS



NON-DETACHABLE PENDANTS



COUPLINGS



Trade Mark Reg. U. S. Pat. Off.

THE BEAD CHAIN MANUFACTURING CO.
BRIDGEPORT CONNECTICUT



Enjoy

SMOOTH
SAILING

with the

1937 RYBOLT LINE
CAST and STEEL FURNACES

THERE'LL be smooth sailing in 1937 for dealers handling the complete RYBOLT line. The past few years have taught homeowners to seek values. They know there's no money saved in buying cheaply and being forced to replace later. That's why you'll be able to sell them on the RYBOLT line. Strength and Economy are prime features in every RYBOLT Furnace and not the least of their selling points.

Enjoy a profitable year—handle RYBOLT.



CAST IRON

The 5 point cast iron with its efficiency quality time proven economy features is strength and price are combined still the choice of heating men all to give a matchless sales proposition over the country. Eye appeal for wide awake dealers.

STEEL

A worthy companion to the cast RYBOLT. Scientific design and iron RYBOLT. Every possible advantage to be gained in warm air the famous RYBOLT construction combine to make a furnace good for many years of economical heating is incorporated in the steel trouble-free heating.



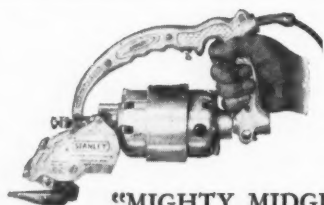
For a complete air conditioning system the RYBOLT Series 150 stands unchallenged. A fully complete unit with filters, blower, automatic humidifier, etc. it answers the homeowner's demand for clean, healthful, low cost air conditioning.

Write NOW for literature.

THE RYBOLT HEATER COMPANY
ASHLAND OHIO

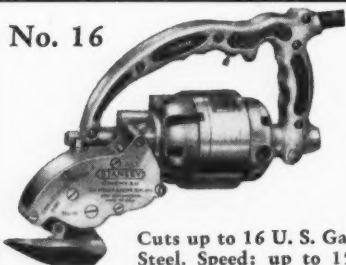
STANLEY UNISHEARS

For Lower Shop Costs



"MIGHTY MIDGET"

Cuts up to 18 U. S. Gauge Steel. Speed: up to 15' a minute. Easier to handle than snips — 100% safe — cannot cut the user. Interchangeable, easily sharpened blades. Net weight, 7 lbs.



No. 16

Cuts up to 16 U. S. Gauge Steel. Speed: up to 15' a minute. Patterned after the "Mighty Midget", it is light, easy to handle. Large reserve capacity for continuous production. Net weight, 10¼ lbs.

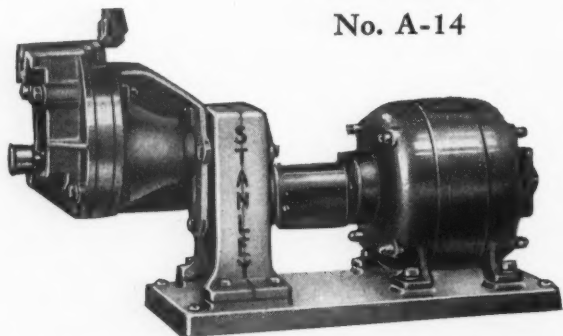
No. 144



A larger capacity Unishear — cuts up to 14 U. S. Gauge Steel. Same cutting speed as lighter models. Weighs only 19½ lbs.

BENCH MODEL

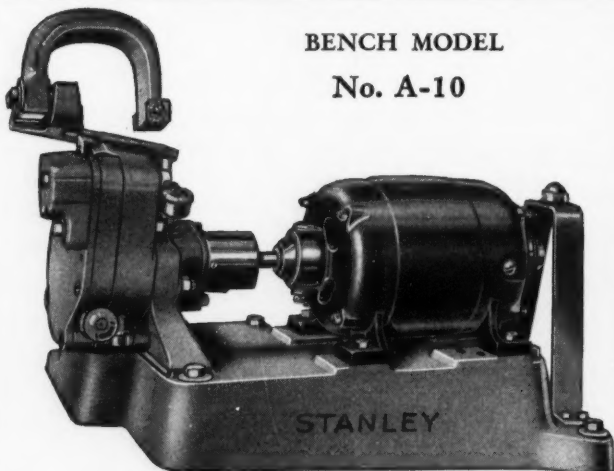
No. A-14



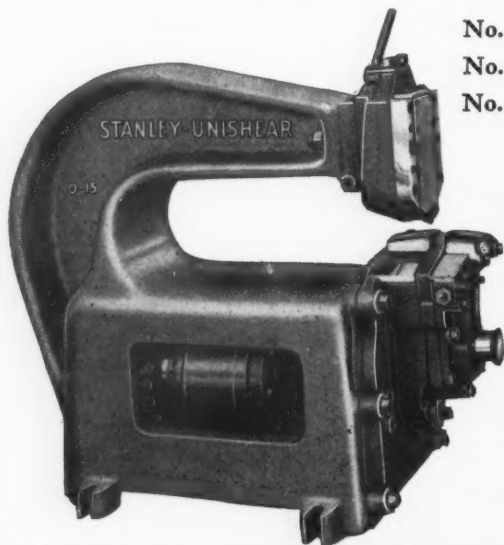
Planned for bench or pedestal mounting, this model can be carried to any job. Operates from light socket. Capacity up to 14 U. S. Gauge Steel, speed up to 15' a minute.

BENCH MODEL

No. A-10



Same as A-14, but with heavier capacity to handle up to 10 U. S. Gauge Steel at cutting speeds up to 10' a minute.



No. 0-15—15" THROAT

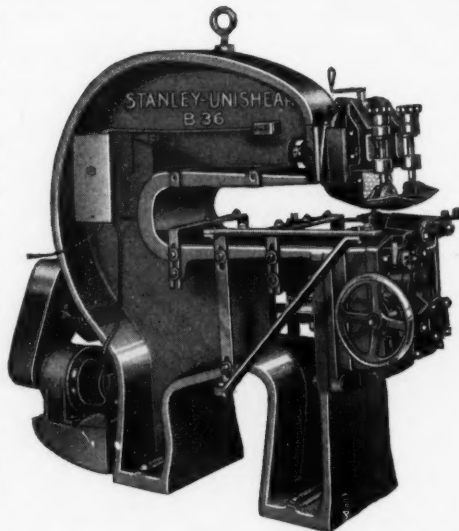
No. 0-36—36" THROAT

No. 0-54—54" THROAT

The "O" Model Unishears can begin a cut in the center of the sheet without a starting hole. Cut up to 14 U. S. Gauge. Also can make circular cuts with radius as small as ¼". Handles sheets up to 96" x 48".

No. B-36

Same operating principles as "O" models, but with tremendous capacity—up to ¼" boiler plate at speeds up to 10' a minute.



DESCRIPTIVE CIRCULAR
ON REQUEST

STANLEY UNISHEARS

STANLEY ELECTRIC TOOL DIV.
THE STANLEY WORKS
New Britain, Conn.

A complete line for Industry

STANLEY ELECTRIC TOOLS

"Cost Less Per Year"

INDEPENDENT REGISTERS



*Always Leading ...
Always Progressing*

• The leadership attained by Independent Registers, Cold Air Faces and Grilles is amply confirmed by the overwhelming demand for these superior products in 1936.

To meet the ever-growing demand, another new plant swung into operation only a few

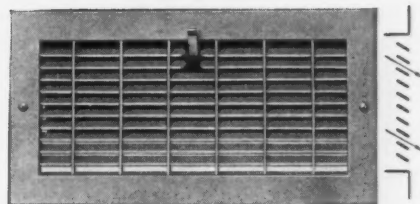
months ago, and is now fully manned and equipped, ready to care for an even greater demand in 1937 . . . "Fabrikated" construction, originated by Independent, is noted for strength, rigidity and large open area. Today, "Fabrikated" is the unchallenged leader in register construction.

"Fabrikated" *Adjustable* Directed AIR FLOW AIR CONDITIONING REGISTERS AND GRILLES

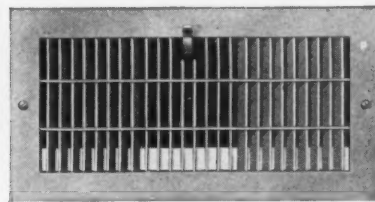
Grille bars may be individually adjusted—before or after installing—to any angle to 45 degrees to direct air flows with accuracy and certainty . . . up or down, right or left. Any register or grille may be set to deflect air in one direction, or in several directions, as desired.

Look to Independent for all your register needs. Send for catalogs.

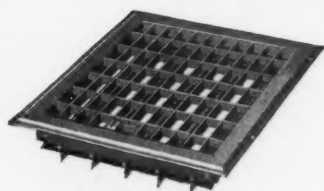
THE INDEPENDENT REGISTER CO.
3741 EAST 93rd STREET CLEVELAND, OHIO



Patented

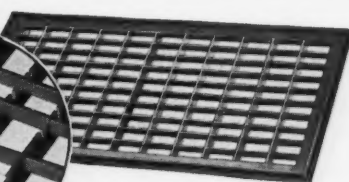
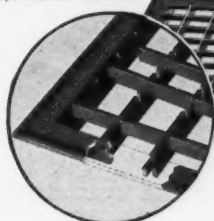


INDEPENDENT "Fabrikated" (REG. U. S. PAT. OFF.) FLOOR REGISTERS AND COLD AIR FACES AND AIR CONDITIONING REGISTERS AND GRILLES

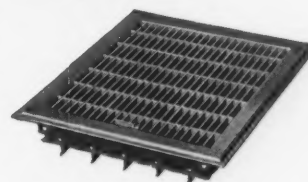


STANDARD MESH

82% OPEN AREA



ANY SIZE • ANY FINISH



CLOSE MESH

PEER

Yes! For every purpose and every purse there are Peerless built Furnaces and Air Conditioning Units. Each and every one is built to give the utmost service for the price involved and will do its job of heating or conditioning efficiently, economically and faultlessly.

The Peerless Line enables you to cater to everyone . . . to figure on every type of installation, for the great variety of fine furnaces at every price range assures

you
at t
Peer
in s
our
help
Take
writ
grea
and
sales

PEERLESS BOILER PLATE FURNACE WITH PRESSURE HEAT TUBES

Actually shoots the air to every room in the house. Fourteen pressure tubes force the air to every corner at a speed 50% greater than ordinary furnaces. It means better and less fuel cost.

PEERLESS 48-A SERIES STEEL FURNACE

With V-Baffle Radiator. Exclusive hot blast construction assuring perfect combustion. Draw-center rotating grates on case hardened steel balls. Double feed doors. Malleable iron handles that lock tight. Water coil ports for one inch water coil above feed doors.

"PLEASANT HOME" RIVETED STEEL FURNACE

Riveted and caulked assuring a gas-tight and smoke-tight furnace. Highest quality construction allowing you to guarantee it against any defect or heating fault when properly installed.

FANS
BLOWERS

CAST
IRON
FURNACES

FANS

AIR
CONDITIONING

STEEL
FURNACE

BOILER PLATE FURNACE
CONDITIONING

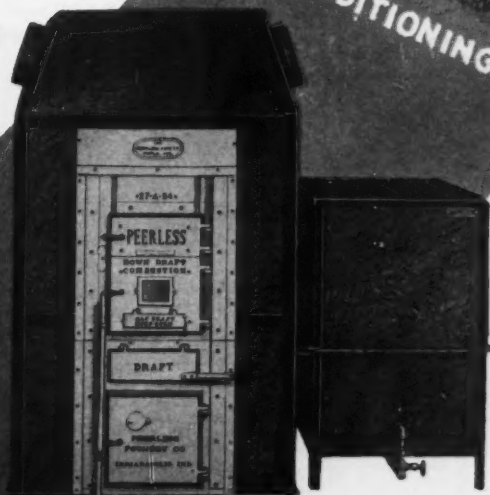
PEERLESS

LESS

you of being able to supply just what they want at the price they want to pay.

Peerless dealers also receive complete co-operation in sales promotion and credit extension . . . and our engineers are always at your service to help assist in difficult heating problems. Take a few minutes **NOW** and write for complete details of this great Peerless line. It can and will increase your sales and profits.

AIR CONDITIONING



PEERLESS AIR
CONDITIONING
UNITS

Completely engineered and built by Peerless. Not just another assembled unit. Furnace, blower and all additional equipment manufactured by Peerless into one balanced unit.

PEERLESS CAST IRON FURNACE

Positively the last word in cast iron furnaces embodying such features as: one piece radiator, heavy corrugated combustion dome, heavy ribbed firebowl, duplex grate, slip over front, surface ground doors, up-right shaker handle, detachable hinge bracker.

PEERLESS CLEANAIRE

Compact, efficient and easy to install. Three section mineral filter removes all dirt and impurities, extremely quiet, built-in motor and precision blower wheel.

PEERLESS BLOWERS

As quiet as the quietest electric refrigerator, but a very powerful air circulating agent. Its efficient, trouble-free operation assures maximum heat at minimum cost.

FANS

FURNACES

RIVETED
STEEL
FURNACES

BLOWERS

CAST IRON FURNACES
AIR CONDITIONING

P
O
O
R
M
A
N
S
C
O
T
T
A
G
E

FOUNDRY CO.

INDIANAPOLIS
INDIANA



Good-working
Qualities

are built into
BETHLEHEM *galvanized* SHEETS

PUTTING the good working qualities into Bethlehem Galvanized Sheets is a process that proceeds step by step—just as a construction job does. They are easy to bend and fabricate because the properties that make them so are literally built into them. From the melting of the steel to final inspection each operation is controlled with an eye to its effect on forming qualities.

It is for this reason Bethlehem Galvanized Sheets are so economical for duct work or other fabricated uses. They stand up to double-seaming at elbow bends with-

out cracking. Seams are smooth and uniform. Their tight galvanizing doesn't flake or peel off.

And for rust-exposed applications, sheets of Beth-Cu-Loy *copper-bearing* composition are similarly dependable, make possible the same desirable combination of low fabricating costs and a first-class installation. The copper content in Beth-Cu-Loy Sheets adds little to their cost. But disinterested tests have indicated that it increases their resistance to rust by from two to two and one-half times.

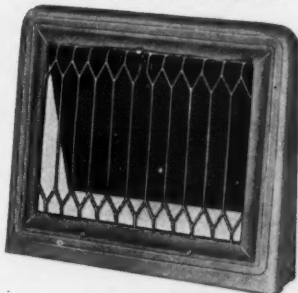
BETHLEHEM STEEL COMPANY



DOUBLED FACTORY PRODUCTION

US Carries on for 1937 Develops Output and Maintains Their Old SUPERIOR QUALITIES in the FINEST in AIR CONDITIONING and GRAVITY HEATING REGISTERS

National Baseboard Register



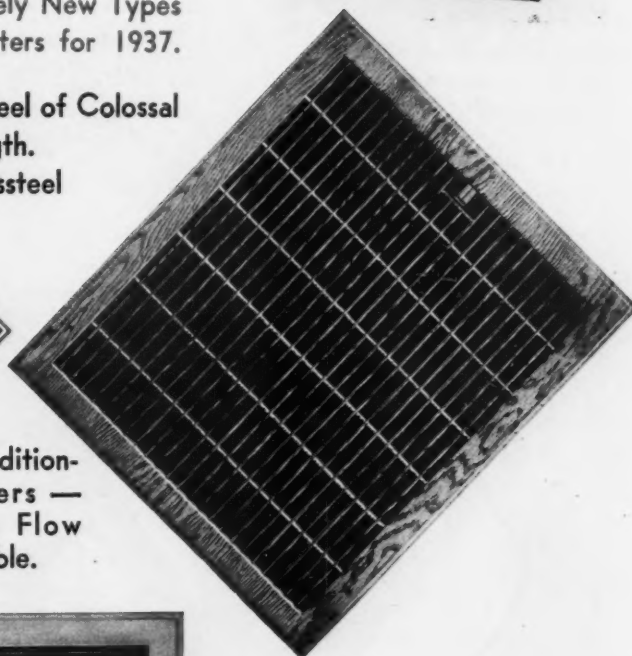
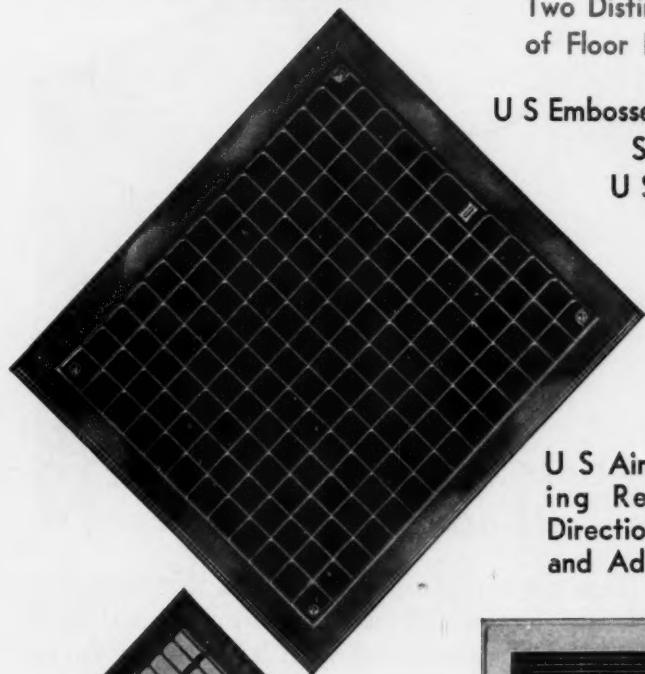
The TWO MAJOR LINES in Vogue with the BEST in MODERN HEATING SYSTEMS. A Uniform Design available throughout the job for every required purpose.

Panama Baseboard Register

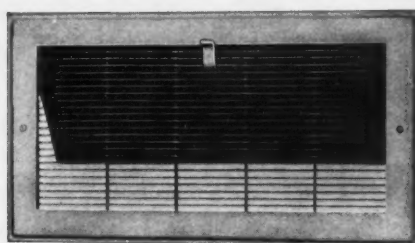


Two Distinctively New Types of Floor Registers for 1937.

U S Embossed Steel of Colossal Strength.
U S Trussteel



U S Air-Conditioning Registers — Directional - Flow and Adjustable.



New U S Special STEEL Faces develops more definite Power and strength than any type of Cold Air made.



Also with Damper-Stop. Write for Latest Catalog for Complete Details of these New Developments.

U S TRUS-STEEL Made in Open and Close Space. Perfectly made and Finished. No Flaw, Corner Cracks or Bad Spots.

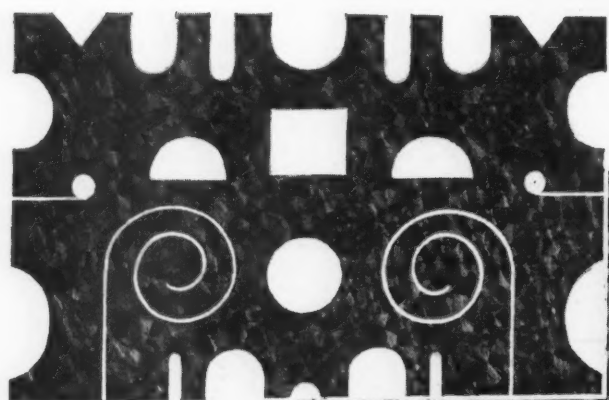


Write for complete Catalog No. 27 and Pocket Manual 27

UNITED STATES REGISTER COMPANY, BATTLE CREEK, MICHIGAN

Minneapolis, Minn. Kansas City, Mo. Albany, N. Y. New York City San Francisco, Calif.

NO JOB is too tricky for the **SCROLL-PIVOTER**



Actual photograph of some of the shapes cut with this marvelous new snip.



Cuts Rings Around all other Snips!

Here's a sensational new snip, the exclusive features of which cannot be appreciated until you have actually cut with it. No other form-cutting snip will do a quicker or better job — in fact, the pivoting principle of this new snip enables it to cut intricate shapes with an incredible ease that no other snip can equal. It will cut ordinary galvanized sheets up to 18-gauge, and Monel Metal sheets of average thickness.

\$ 4⁹⁵

Note the blades lie flat exactly opposite from the ordinary cutting blade. With this flat blade you can slip around corners, circles and make any angle cut you want. It pivots as it cuts!

Length 12 in. Weight 1 3/4 lb. Finished in dull grey nickel. Rust resisting. Slightly higher in price Denver and West; also Canada.

WISS makes a complete line of
SNIPS for every purpose, including
HIGH POWER • BULLDOG • NU-GRIP

Made in Newark, New Jersey, by
J. WISS & SONS

makers of fine shears and scissors since 1848

WISS 9X SNIP "SCROLL-PIVOTER"

EVERYTHING IN COPPER....

● HUSSEY

There is no need to split your order when you need a variety of copper products on those jobs. Check over the following list and you'll see for yourself that almost everything can be had in *one* order from *one* dependable house. HUSSEY Service has become a by-word with the trade . . . thirteen conveniently located sales offices and seven strategically placed warehouses will get everything to you in double-quick time.

HUSSEY COPPER PRODUCTS—SHEET COPPER

Corrugated Round Copper Conductor Pipe—Sizes 2 in. to 6 in. 10 ft. Lengths.

Corrugated Square Copper Conductor Pipe—Sizes 2 in. to 5 in. 10 ft. Lengths.

Plain Round Copper Conductor Pipe—Sizes 2 in. to 6 in. 10 ft. Lengths.

Copper Straps—For square pipe only. 2 in. to 5 in.

Copper Eaves Trough—Single Bead, Lap Joint; Double Bead, Lap Joint; Single Bead, Slip Joint; Double Bead, Slip Joint. Sizes 3 in. to 10 in. 16 oz. 10 ft. Lengths.

Copper Gutter Ends, Caps and Outlets—all sizes.

Copper Roof Gutter—All sizes. All shapes. All weights.

Copper Roof Ridging — Sizes 7 in. to 14 in. 10 ft. Lengths.

Copper Eaves Trough Mitres—Inside Corner; outside corner. Single Bead, Lap Joint; Double Bead, Lap Joint; Single Bead, Slip Joint; Double Bead, Slip Joint. Sizes 3 in. to 7 in.

Corrugated Copper Round Expanding Elbows and Shoes—30°; 45°; 60°; 75°; 90°. 16 oz. Sizes 2 in. to 6 in.

Corrugated Copper Square Expanding Elbows and Shoes—45°; 60°; 75°; 90°. 16 oz. Sizes 2 in. to 5 in.

Plain Round Copper Elbows and Shoes—30°; 45°; 60°; 75°; 90°. 16 oz. Sizes 2 in. to 6 in.

Copper Cut-Offs — Plain Round. Sizes 2 in. to 6 in.

Square Corrugated. Sizes 2 in. to 5 in. Round Corrugated, sizes 2 in. to 6 in.

Copper Wire Conductor Strainers—Round and Rectangular. Sizes 2 in. to 6 in.

Copper Conductor Heads—To fit Round or Square Pipe.

Gutter Hangers—Adjustable Bronze or Copper. Also Copper Strap Hangers. All standard sizes.

Copper Conductor Pipe Hooks — Corrugated Round Hinged Hooks, (Wood Drive) Sizes 2 in. to 6 in. (Brick Drive) Sizes 2 in. to 6 in. Plain Round Hinged Hooks (Wood Drive) Sizes 2 in. to 4 in. (Brick Drive) Sizes 2 in. to 6 in.

Copper Conductor Pipe Sickle Hooks—Corrugated, sizes 2 in. to 4 in. Plain, sizes 2 in. to 6 in. Square Wired, sizes 2 in. to 5 in. For Wood and Brick.

Cast Bronze Pipe Fasteners — For Brick, Stone and Wood. All sizes.

Copper Strap Hangers—Sizes 4 in. to 6 in.

Copper Shingles—Various weights. 16 oz. recommended. 133 Shingles to the Square.

Soldering Coppers — Bottom, Roofing, Hatchet and Pointed. Also special styles to specifications.

Copper Rivets — Flat Head Copper Tinner's Rivets. Brazier Rivets. Round, Flat, Oval Head or Special Rivets.

Copper Wire Nails—Regular and Slating. Special styles made to specifications.

Detailed information on any item listed will be furnished upon request.

C. G. HUSSEY & COMPANY, Pittsburgh, Pa.

Division of Copper Range Co.

WAREHOUSES

CHICAGO
CINCINNATI
CLEVELAND
NEW YORK

PHILADELPHIA
PITTSBURGH
ST. LOUIS

EXECUTIVE OFFICES AND MILLS
PITTSBURGH, PENNSYLVANIA

DISTRICT SALES OFFICES

BALTIMORE
BUFFALO
CHICAGO
CINCINNATI
CLEVELAND
DALLAS
NASHVILLE

NEW ORLEANS
NEW YORK
PHILADELPHIA
PITTSBURGH
ST. LOUIS
SAN FRANCISCO

WHEN YOU WANT TO MAKE TRACKS TO THE

NEAREST

Enduro

DISTRIBUTOR

*Licensed under Chemical Foundation
Patent No. 1339378.*

ALABAMA
Birmingham.....Arnold Supply Company

CALIFORNIA
Los Angeles.....Earle M. Jorgensen Company
Oakland.....Earle M. Jorgensen Company
San Francisco.....Gilmore Steel & Supply Co.
San Francisco.....Tayler & Spotswood Company

COLORADO
Denver.....Goldberg Bros.
Denver.....M. L. Foss, Inc.

FLORIDA
Jacksonville.....J. G. Christopher Company
Miami.....Railey & Milam, Inc.
Tampa.....Eagle Roofing & Art Metal Works
West Palm Beach.....Roofing & Sheet Metal Supply

ILLINOIS
Chicago.....Chicago Steel Service Co.

INDIANA
Evansville.....Ohio Valley Hardware & Rfg. Co.
Hammond.....W. J. Holliday & Company
Indianapolis.....Tanner & Company

KENTUCKY
Louisville.....Conner Manufacturing Company

LOUISIANA
New Orleans.....Equitable Equipment Company, Inc.

MASSACHUSETTS
Boston.....Hawkrigge Bros. Company
Boston (South).....Avery & Saul Company

MICHIGAN
Detroit.....Buhl Sons Company
Grand Rapids.....The Behler-Young Company

MINNESOTA
St. Paul.....Farwell, Ozmun, Kirk & Company

MISSOURI
Kansas City.....Townley Metal & Hardware Co.
St. Louis.....Hammond Sheet Metal Company

NEBRASKA
Omaha.....Gate City Iron Works

NEW JERSEY
Newark.....International Corporation

NEW YORK
New York.....Bruce & Cook, Inc.
Albany.....The Woodward Company
Brooklyn.....K. & S. Metal Supply, Inc.
Buffalo.....Beals, McCarthy & Rogers, Inc.
Rochester.....W. A. Case & Son Manufacturing Co.
Utica.....Charles Millar & Son Company

OHIO
Cincinnati.....The Mitchell Steel Company
Cleveland.....The J. M. & L. A. Osborn Co.
Cleveland.....The Hamilton Steel Company
Cleveland.....The Prince & Izant Company
Columbus.....Vorys Bros., Inc.
Dayton.....Ohio Metal & Manufacturing Co.

OREGON
Portland.....J. E. Haseltine & Company

PENNSYLVANIA
Philadelphia.....Hill-Chase & Company
Philadelphia.....W. F. Potts, Son & Company

TENNESSEE
Memphis.....Pidgeon-Thomas Iron Company

TEXAS
Houston.....F. W. Heitmann Company

WASHINGTON
Seattle.....Barde Steel Company
Seattle.....Doran Company
Seattle.....Seattle Hardware Company
Spokane.....Jensen-Byrd Company

WISCONSIN
Milwaukee.....Moise Steel Company

CANADA
Montreal, P. Q.....James W. Pyke & Co., Ltd.
Toronto, Ont.....Drummond McCall & Co., Ltd.



Republic Steel Corporation

GENERAL OFFICES . . . CLEVELAND, OHIO
ALLOY STEEL DIVISION . . . MASSILLON, OHIO

ENDURO, Republic's Perfected Stainless Steel, is available in a wide range of analyses — in a variety of finishes — and in all commercial forms. Consult your nearest distributor or write us for complete detailed information.

When writing Republic Steel Corporation for further information, please address Department AA.

AMERICAN ARTISAN

Volume 106

Number 1

Let's Look at the Record

ANY survey of business in the warm air heating, sheet metal, roofing and ventilating contracting and residential air conditioning industry can be summed up in these few words—"All activities are far above 1935."

This is not news to members of the industry. Contractors everywhere report work on hand far beyond ability to complete according to schedule. Contractors in communities of all sizes and characteristics have felt the pinch of mechanic shortage, a condition which reports indicate is becoming more acute monthly. Material and equipment deliveries have been falling behind orders—days and weeks intervening where delivery in a few hours was the rule a short time ago.

In numerous communities, reports indicate, contractors have had to refuse orders because it has been impossible to guarantee installation according to specifications.

It has been interesting to note that this piling up of orders has been out of all proportion to the volume of new construction—indicating, probably, the impetus given repair, remodeling and renovation by the very definite pressure placed upon these activities during the last three years. This preponderance of repair, remodeling and renovation work has been noticeable alike in residential, commercial and industrial fields.

Sources of Work

Of course, there has been a very encouraging increase in general building construction. New schools, industrial plants, houses of all price classes, some public building—all show increases as reported in other surveys in this issue. But taking the country as a whole, the big percentage of work has come from betterments to existing structures rather than from new building.

A clear picture of the changes and advances of 1936 and an insight into what to expect in 1937, is shown in the following pages where the results of AMERICAN ARTISAN's survey of Business for 1936 is classified by distinct fields of activity. The results reported in this survey have been compiled from questionnaires mailed some weeks ago to all possible sources of information through the country. Chiefly, however, the manufacturers of the many products used in the field

have been queried for reports of their business volume, but these reports have been supplemented by other material gathered from different sources.

Metals

As can be appreciated, manufacturers of sheet metal materials are not able to maintain a very close check upon the final application of their products. Sheets produced and shipped into jobbers stocks may ultimately find their way into a hundred different products or lines of work within this industry.

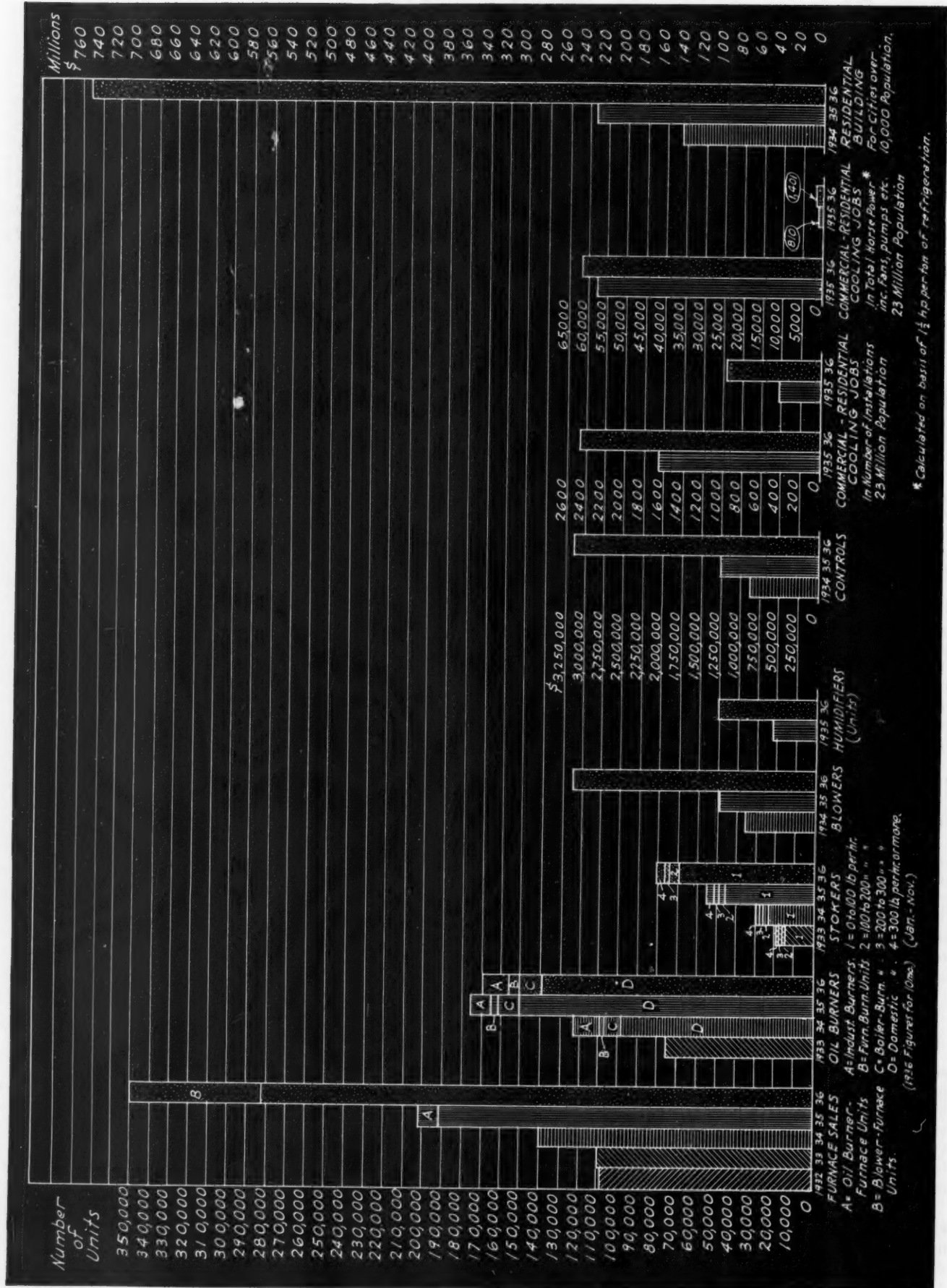
But the total production of materials which very likely are used in our industry, has shown a marked increase. Galvanized iron, as flat sheets or corrugated roofing or patented roofing types or sheets for fabrication into hundreds of products and uses has followed a steady upswing all during 1936. That sheets produced have actually gone into the sheet metal industry is born out by reports from jobbers showing very noticeable increases in quantities purchased by sheet metal and heating shops.

The metals of special composition, as well as the more expensive metals used in construction of the better class, have all shown steadily increasing sales throughout the year. In view of the fact that large architectural sheet metal projects have been singularly scarce during the year, the answer to where these materials have gone must be found in repair and replacement or betterment of equipment and apparatus used throughout industries now showing activity for the first time in several years.

Roofing

All phases of the roofing industry have enjoyed greatly increased business. Built-up roofing, for example, has shown such an increase in contracts awarded that it is difficult to find a roofer who has not been busy all year. A very pleasant percentage of the contracts awarded for built-up roofing have been of a size which can only be accounted for by large industrial and commercial building repair and betterment.

The composition shingle, steep roofing and composition siding fields have all been busy due, in a large measure, to betterments made on existing houses as owners have sought to put their dwellings in first class



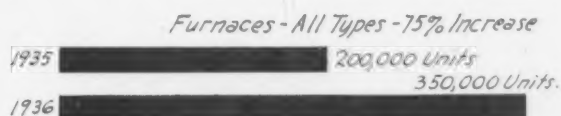
[A Charted Summary of 1936 Business]

condition with money made available at reasonable rates of interest and under long term payment contracts.

Metal roofing, as a class, has, perhaps, felt the stimulation the least of the roofing classifications, but some activity is reported industrially as more and more mills are placed in production.

Furnaces

Some weeks ago a questionnaire was mailed asking for figures on increased business in furnace heating and warm air, air conditioning. The replies have been tabulated and an averaging factor applied to take cog-



nizance of the difference in total production figures of the firms reporting. The questionnaires asked for increases in production for different types of furnace heating units as compared to production figures for 1935. The industry has, as an authoritative basis for calculating, the government's report of 200,000 furnaces produced in 1935. Using 200,000 furnaces as a basis, AMERICAN ARTISAN's survey indicates that an overall increase of 75 per cent is a conservative figure for 1936 furnace production.

This increase means that there was produced in 1936 some 350,000 furnaces of all types.

In compiling this general increase of 75 per cent over 1935, the reports received were grouped according to the production capacities of the firms reporting. Analyzing these reports further, the survey shows that the group of manufacturers with large individual productions and ordinarily considered as accounting for one-half of total production showed an increase in production of 85 per cent.

The group of manufacturers in the classification next lower in production volume showed a general 65 per cent increase.

The group of manufacturers containing by far the greatest number of producers, but accounting for approximately one quarter of the total number of furnaces manufactured, showed an increase of 75 per cent.

Among the large manufacturers percentages of increase ranged from a low of 40 per cent to a high of 100 per cent. In the second group the low figure of increase reported was 50 per cent while the highest increase was 105 per cent. In the third group the startling fact was disclosed that the high increase was more than 600 per cent with a low increase of 10 per cent.

Only one report showed the same production for 1936 as for 1935 and not one manufacturer showed a drop in production.

Furnace Trends

The questionnaire was designed to show in what classifications production was increasing and where production was dropping off. While many persons

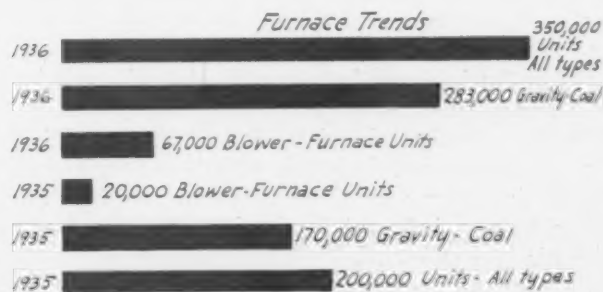
acquainted with the industry undoubtedly would guess that production of gravity, hand fired, units was falling off in percentages of total production (but perhaps not in actual number of units produced) many may not realize just what changes have taken place.

Total unit production for gravity, hand-fired coal furnaces showed percentage of total production drops from a low of 1 per cent to a high of 40 per cent. A very representative portion of reporting firms listed reductions of between 6 and 12 per cent.

For the industry as a whole, a general reduction of 13 per cent in the proportion of gravity type, hand-fired coal furnaces to total production of all types of furnaces seems conservative.

Equally interesting are the figures arranged to show whether gravity types for other classes of fuel (oil, gas and stoker fired) is increasing or decreasing. The changes for all these types were not radical. One report showed a reduction of 80 per cent in gravity gas-fired units, but omitting this unusually large change most reports showed decreases of just under 6 per cent. No one group (gas, oil or stoker fired) showed unusual change characteristics—as a matter of fact, the decrease was surprisingly uniform throughout all the three types.

A very general summary might be—manufacture of gravity units in terms of a percentage of total produc-



tion is falling off, but the overall change is slight and the general increase in production of all types can well show that there were far more gravity furnaces sold in 1936 than in any recent previous year.

Air Conditioning Furnaces

The air conditioning furnace group, comprised of those furnaces sold with a blower-filter or blower-washer matched unit attached or included within the furnace casing, showed appreciable changes in relation to total production. For example, in blower-furnace units using hand-fired coal, the percentage of increase in total production varied from a low of 1 per cent to a high of 25 per cent with an average weighted increase of 9 per cent. In the same group, a number of manufacturers showed a decrease in units of this type averaging 3 per cent of decrease.

The blower-furnace units for oil and gas (including both the units with the burner sold with the furnace and units designed for any make of burner) showed much greater fluctuations—principally in the direction of increases in relation to total production. As a matter of interest, the gains made in these two classifications just about balance the losses shown in the previously mentioned gravity classifications.

The low percentage of increase reported was 1 per

cent, but the highest change was 100 per cent. Eliminating the very high and the very low reports gives a change of just about 13 per cent which very nearly balances the decrease in gravity, hand-fired units.

When we added together the 13 per cent decrease in gravity units and the 13 per cent increase in blower-furnace, oil or gas-fired units we have an overall change of 26 per cent. Stated another way there was produced in 1935 about 170,000 furnaces designed for gravity operation plus 20,000 furnaces for blower-furnace operation using coal plus 10,000 blower-furnaces for automatic firing. In 1936 there was produced about 283,000 furnaces designed for gravity operation and about 67,000 blower furnace units for coal, oil or gas.

Reports received varied too greatly to say conclusively that the reduction in gravity, hand-fired units is balanced by the increase in production of oil or gas-fired, blower-furnace units—the balance is really a matter of coincidence.

Nevertheless, it can be stated (as verified by checks made through contractors) that there is a trend toward the automatic forms of mechanical circulation units—toward winter air conditioning, in other words.

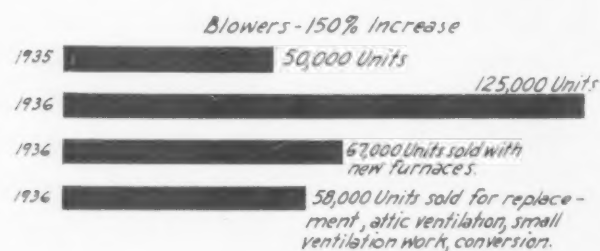
One of the interesting disclosures of the survey shows that during 1936 winter air conditioning, as defined above, for the first time showed very definite signs of demanded acceptance by home owners in the smaller communities and the rural territories all over the country.

Stoker fired, blower-furnace units showed small increases and accounted for only a very small percentage of total production. In view of the fact that stoker furnaces are comparatively new, this is not surprising, but another year may show the same trend to the stoker unit as indicated in the increase in sales of domestic size stokers.

Blowers and Blower Units

Some most surprising changes were indicated in the reports of blower production. Also in the production of blower wheels, blower assemblies and housed blower units. The changes in all cases point to decided increases.

For total production of blower units of all types reports showed increases ranging from a low increase



of 25 per cent to a high increase of more than 300 per cent. Interesting is the fact that the large increases were not made by new manufacturers, but by old established firms. Several firms showed total production increases above 200 per cent; several between 100 and 200 per cent and a long list with increases from 25 to 100 percent.

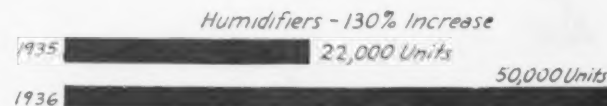
In the housed unit classification, several manufac-

turers indicated increases in production of more than 400 per cent, several showed increases ranging from 100 to 400 per cent, while the smallest increase reported was 15 per cent. The highest increase in production of any product reported occurred in the housed blower unit group, where an increase of 700 per cent was indicated by one manufacturer.

By eliminating the very high and very low increases among the housed blower group and assigning a weighted production figure to the remaining reports, an average production increase of more than 170 per cent is established, but allowing for some duplication among reports where units may have been reported by furnace manufacturers and contractors and also reported by the blower manufacturers it would seem as though a better average is 150 per cent.

With 50,000 blower units reported for 1935, there must have been at least 125,000 units produced and sold in 1936.

The figures compiled on the sale of assemblies are interesting, but difficult to check. Assemblies, as tabulated in this survey, are blower motor or fan-motor



apparatus sold to be cased within the furnace housing or sold to be housed by the manufacturer or the contractor who desires a special casing.

Only one decrease was reported in this group, but 424, 300, 250, 100 per cent increases in production and sale were submitted. Wheels alone showed large increases, but where these wheels are used is questionable and because there was no size segregation in the reports it is probable that many of these wheels were used in oil burner, stoker and other automatic fire devices.

These figures for increased production of all types of air movers when compared with figures for blower-furnace units bears out the previous statement that there is a marked increase in the sale of mechanical circulation, winter air conditioners of all types.

Humidifiers

Some very interesting figures were submitted to the questionnaire covering humidifiers of the automatic type. Most of the reports submitted gave actual unit production; other reports carried changes in volume in percentages. Putting these returns together establishes a general increase of 130 per cent. Applying 130 per cent of increase to agreed sales of humidifiers in past years indicates that there must have been sold at least 50,000 automatic humidifiers in 1936.

This large increase is accounted for, we believe, by the increase in sale of winter air conditioners. To the best of our knowledge all winter conditioners are now equipped with some type of automatic humidifier. There must be, also, a large increase in use of the automatic type of humidifier in gravity furnaces and the replacement market, where an automatic humidifier is added to a furnace having only casing pans, if reports are correct.

Filters

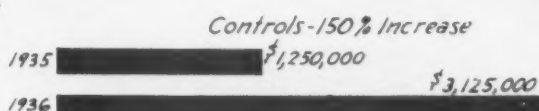
Reports covering filter production and sales were too fragmentary for compilation. Production as reported by the government on a dollar volume is not, in our estimation, a very clear indication of sales in our field. Of course, there was a very substantial increase in general sales, since new blower business alone means an enlarged market.

Our survey indicates, we believe, that the greatest market has not yet been worked to most advantage. We refer to the replacement market. We gather from reports submitted, that contractors are permitting too many filters to remain in place long after their useful life is over, or after resistance has been built up beyond the safety margin or until cleaning or replacement should have been recommended previously.

An interesting statement by one authority in the filter field points out that there is need for some concerted effort on the part of contractors to check filter performance at stated periods. When the filters are fresh the resistance should be checked by means of a draft gauge to see that the resistance is not greater than the resistance allotted to the filters in the design of the system. Then checks with the gauge should be made from time to time (as judged by the cleanliness of the house) and when resistance exceeds the designed resistance for the filters, the units should be replaced or cleaned according to type. We believe that this practice if followed will result in much greater customer satisfaction with air cleaning.

Automatic Controls

Reports of control production and sale evidently cannot be supplied with sufficient certainty to be used in a survey of this kind. In making the survey an attempt was made to get sales in terms of types of



apparatus used. Thus we asked for figures on thermostats, fan controls, limit controls, humidistats, combinations for automatic firing units and so forth. While manufacturers indicate a generally large increase in production of all items, final sale by types is not available because most control apparatus is sold through jobbers and the manufacturer has records only of sales to jobbers and the jobber, in turn, has no idea of where the apparatus goes nor how it is used.

The conclusion to be drawn is that there has been an increase of at least 150 per cent by dollar volume in control sets on hand-fired coal, gravity installations and an equal increase in apparatus used on the mechanical circulation, blower-furnace unit. The dollar volume for 1936 at 150 per cent increase will be \$3,125,000 as compared with \$1,250,000 for 1935.

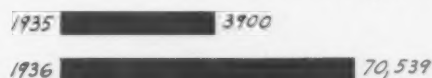
Checking back against problems submitted to jobbers or manufacturers and against requests for suggestions on ways of controlling winter air conditioners, we find that such improvements as zone control, complete control of all equipment units through master control is gaining favor rapidly.

All up and down the line the tendency on the part of the contractor seems to be to use control apparatus and control hookups which give fraction of a degree reaction to house temperature changes and that very close control of all interior temperatures is coming rapidly to the front.

Stokers

One of the remarkable changes of 1936 has been the wide acceptance accorded the mechanical coal stoker. Surveys and questionnaires to contractors show that stokers are finding ready sale in communities of all sizes and types and that even in strong gas and oil territories stokers are making rapid headway. As re-

Stokers (Class 1) 82% Increase (Jan-Nov. 1936)



ported in American Artisan several times during 1936, contractors of all types are now selling stokers and even greater expansion in outlets is likely for 1937.

From a unit production standpoint government figures show that during the period January to November, 1936, more than 70,000 stokers of all sizes were sold as compared to 40,000 for the same period of 1935 and 23,000 for the same period of 1934. Sales in class 1 (less than 100 pounds per hour capacity) for January-November, 1936, were almost 63,000 units—an increase of more than 85 per cent over 1935.

Oil Burners

Oil burners continued to show gains in sales; the total for all types for January-November, 1936, being just under 140,000 units as compared with 100,000 units for the same period of 1935.

The same government figures show that there was an increase of 3,000 units in the burner-furnace group and an increase of another 3,000 units in the burner-boiler group.

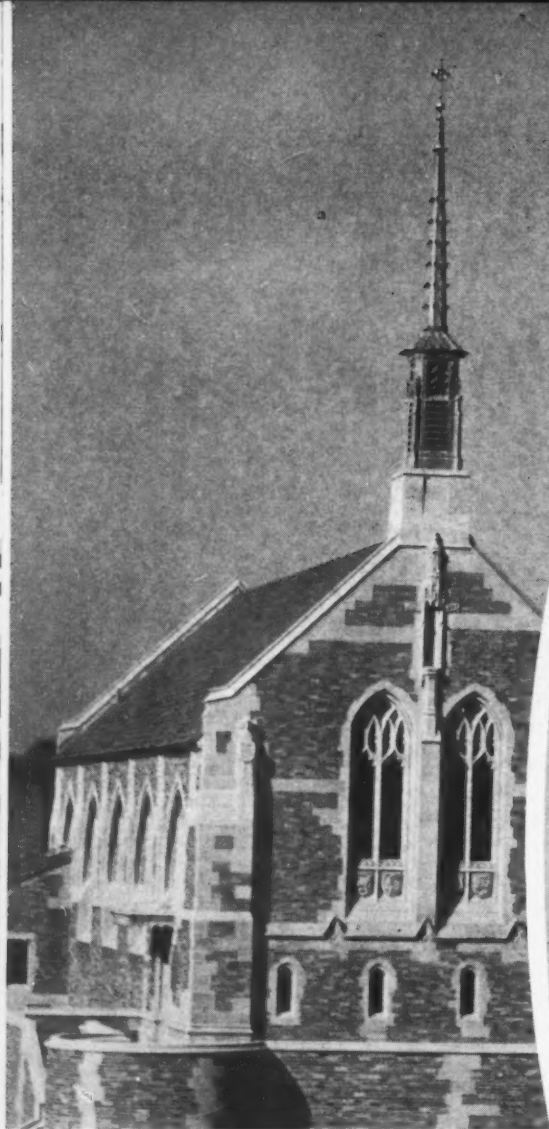
A point of interest to our industry is indicated by the government's report from oil burner manufacturers making burner-furnace units showing that, whereas the sales of burner-boiler units was 11,804 for 1936 and

Domestic Oil Burners (Mech. Draft) (Jan-Nov. 1936)

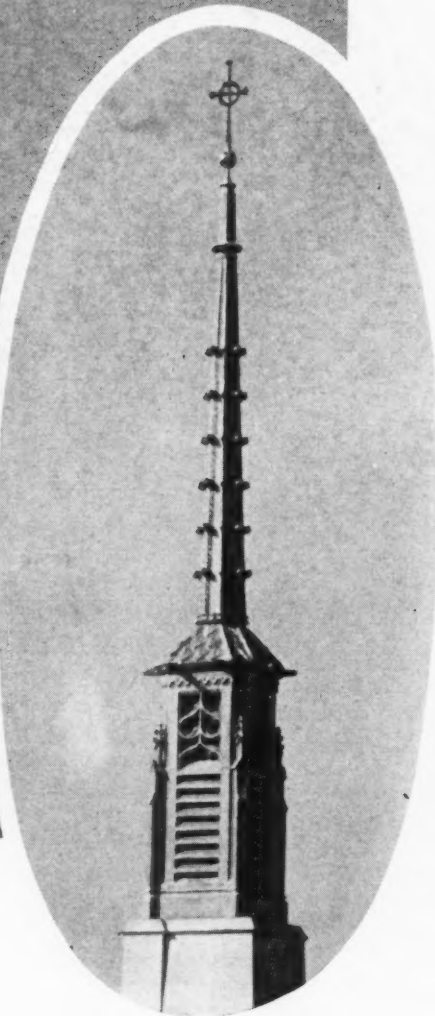


8,823 for 1935, the increase in burner-furnace units was 5,341 for 1936 and 2,398 for 1935. In other words, burner manufacturers' figures show that, while burner-furnace units were only about one-fourth of the burner-boiler units in 1935, in 1936 the burner-furnace units were just under one-half of the burner-boiler units. We should remember that these figures do not include furnace manufacturers making oil-fired units, so if we add the oil burner-furnace units sold by warm air manufacturers for use with any burner the figure would be considerably more than the number of boiler-burner units sold in 1936.

This checks previous figures showing large increases in the blower-furnace-oil burner-winter air conditioner.



The chapel with surmounting fleche and a closeup showing panel and tracery work.



The sheet metal and roofing contract recently completed by Flesch & Schmitt, Inc., Rochester, N. Y., for the Colgate-Rochester Divinity School has two features of interest—the delicate fleche on the chapel and the very extensive use of metal flashings on the dormitory buildings. The photographs and details convey a picture description of this interesting contract.

The Colgate Fleche

IN Rochester, N. Y., the sheet metal and roofing contracting firm of Flesch and Schmitt, Inc., has just completed a combination roofing and architectural metal contract which entails some unusually interesting details of architectural design and application. The contract called for the fabrication and erection of a splendid fleche, application of heavy slate and the use of flashing as weather protection to such an extent that even glass panels in exterior doors are flashed along the bottom edge of the panel.

The contract covers two groups of buildings for the Colgate Rochester Divinity School, in Rochester. The first part of the contract includes the fleche and slate roofing with metal work on the chapel group, while

the second part of the contract includes slate roofing, metal work and flashing on the dormitory.

The Chapel

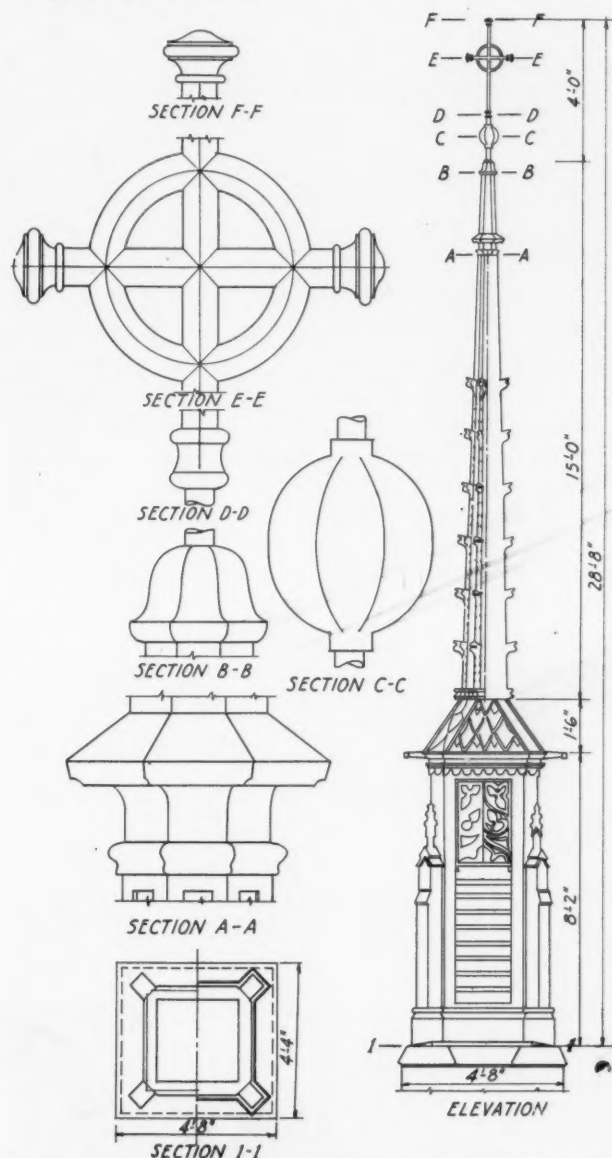
The chapel is a new building connected with older buildings and has a matching face brick exterior trimmed in limestone as shown in the exterior photograph. The most interesting portion of the work, of course, is the fleche with its ornamented square base and crocketed spire and the graceful finial. The metal work proper starts above the square stone base and consists at its lower elevation of a square metal sheathed base with both louvre and tracery panels used in each

face. The projecting buttresses (one at each corner) are also sheet metal. The spire above the base is eight sided with flat surfaces lying between ornamented hips.

Those parts of the fleche employing stampings for ornamentation are of most interest. The tracery panels above the louvres have a flat background and are not, therefore, identical outside and inside. The foliations were made from full sized models and assembled on the back as a panel which was then incorporated into the louvred face of the base.

The louvres consist of formed blades assembled into a panel with wire backing. At each corner stands a three-faced buttress topped with an ornate bishop's crown formed from several stampings.

Just above the louvre sections there is a flat pitched base for the spire which is made up of a top molding course above scaled, sloping faces ending in a large crocket course and a drop edging which ornaments the top of the tracery panels. The scaled panels and the crockets were made up from the necessary stampings, later assembled into panels or units to be erected as complete face sections.

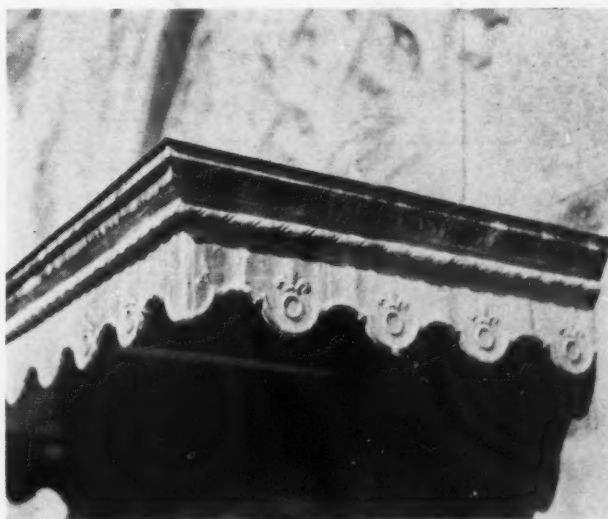


This elevation shows the principal section of the lead-coated copper fleche with details of construction at various elevations up the spire. The text explains how the fabrication and erection was handled through the shop and in the field.

Hips and Crockets

The eight hips of the upper spire are made up of stamped sections enriched with edges incised and inverted like an oak leaf. The incised sections are progressively smaller from bottom to top. At short intervals up the hips stub crockets are used for additional ornamentation. The pan sheets between hips are without ornamentation.

The upper one-third of the spire is without ornamentation.



The canopies on the buildings were lead-coated copper applied upon wood and steel framing and ornamented with a drop edging. The roof is flat locked and soldered. The molding was made in the shop.

tation ending in an octagonal finial base as shown in the detail with a half cap above which is the ankh cross. The cross is composed of formed and spun sections as shown in the details.

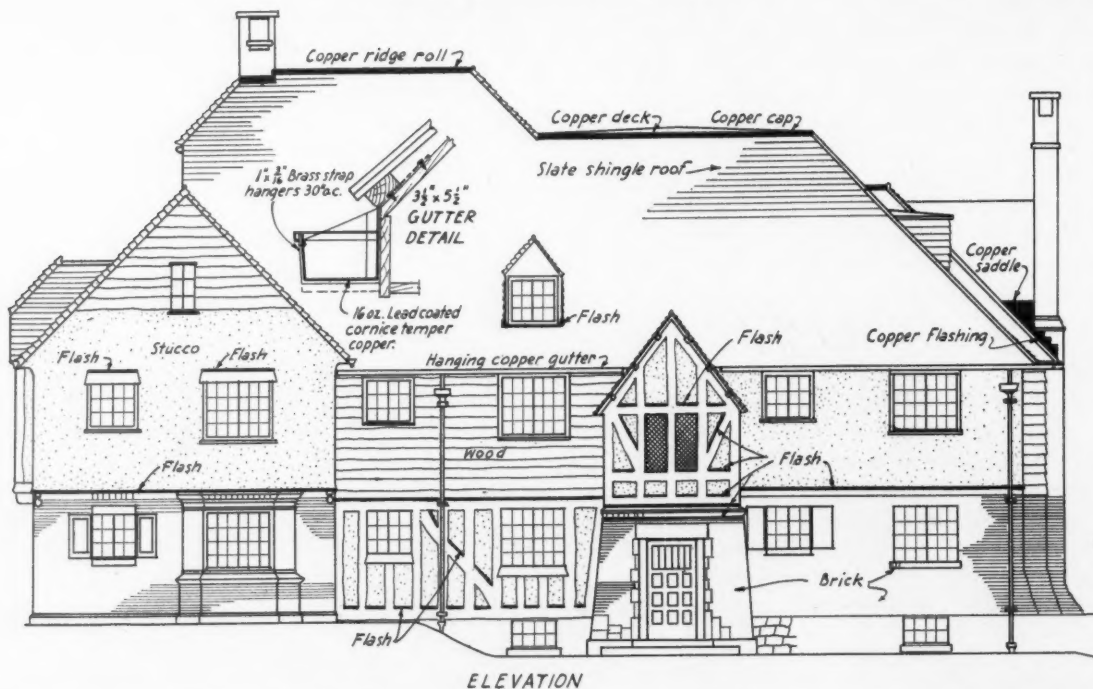
The metal used in the fleche from the base to the bottom of the finial is lead coated copper while the finial is Monel metal covered with gold leaf.

Slate Roof

The roof of the chapel is variegated green, grey, red and rustic slate graduated in thickness from $\frac{3}{4}$ -inch at the eaves to $\frac{1}{4}$ -inch at the ridge, laid with 10 inches of exposure at the eaves reducing to $4\frac{1}{2}$ inches of exposure at the ridge. All slate have a 3-inch head cover and the slate is laid over a 30-pound asphalt saturated felt. All valleys are laid closed.

Flashings, Gutters, Leaders

Flashing throughout is 16-ounce lead coated copper with through wall flashing used liberally under masonry courses. Gutters are double beaded lead coated copper hung with lead coated straps on 3-foot centers. Leader heads are lead coated copper while conductors are soft copper 3 by 4-inch, held $\frac{3}{4}$ of an inch away from the wall. Interesting canopies were installed over two entrance doors. The wood roof was covered with lead coated copper laid flat locked and soldered while the molding at the edges and the ornamented drop edging was made up from stamped sections as shown in one of the photographs.



ELEVATION

Elevation of a dormitory showing in heavy lines the numerous applications of copper flashing. In addition to customary applications, the upper edges of horizontal or pitched beams, lower edges of stucco, sills and lintels were flashed.

Dormitory

The Flesch and Schmitt contract for the dormitory is interesting chiefly because of the extensive use of flashing as weather protection. One of the drawings shows an elevation of the building and gives a clear picture of the flashing application.

The Extensive Flashing

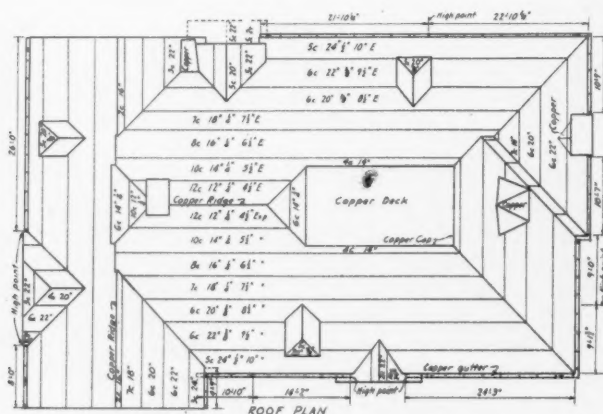
Briefly flashing and metal protection was specified—"at stone belts on chimneys, chimney saddles, roofs of flat dormers, roofs of bay windows, water dams, top and bottom of belt courses all around, cornice returns, the top of all horizontal and slanting half timber work, caps of all wood window casings and heads, horizontal joints in half timbers and beams, the bottom edge of all stucco above brick work, all vertical surfaces rising above the roof lines, sides of dormers, bottom of dormers, vent pipes, tops of all outward opening doors

to be covered with metal and where glass panels are in outside doors the bottom panel of the glass."

Sixteen-ounce lead coated copper and soft copper was used for this work. Gutters, conductor heads and conductors are lead coated copper, while ridges, decks, saddles, etc., are soft copper.

The Slate Roof

The slate roof of the building is variegated green, grey, red and rustic slate graduated in thickness from 1/2-inch at the eaves to 3/4-inch at the ridge with a 10-inch exposure at the eave and 4 1/2-inch at the ridge; slate laid with 3-inch head cover over a 30-pound asphalt saturated felt. Valleys are laid closed and hips are Boston or slate shingled double as indicated.



The slate described in the text was laid according to the course schedule shown on this plan. Metal work is also indicated.



Comparing this dormitory exterior with the elevation drawing above, shows clearly the numerous flashing applications and furnishes an idea of the character of the building.

425,000 New Homes in 1937*

By William C. Bober
Statistical Research Department
Johns-Manville Corp.

IT should be emphasized at the outset of this survey that the necessary statistical information to estimate closely the number of homes built in this country does not exist. Our basic data are widening constantly, but we still have mere statistical "samples" of the production of homes, instead of complete records, in some of the most important sectors of the building field.

There are, of course, two basic sources of information on the production of homes—the figures issued by the Division of Construction of the U.S. Dept. of Labor and those furnished by F. W. Dodge Corporation. I propose to examine the Dept. of Labor data first and submit a schedule which shows the number of homes built in the first 9 months of 1936.

It is well at this point to remember that each apartment in a multi-family dwelling counts as a home.

Over 17 per cent of our population lives in 14 big cities with over 500,000 people. It is natural that our building information should be most complete in this sector which comprises 21,315,411 people. All 14 cities are covered by U.S. Dept. of Labor permit tables and the "coverage" from this angle is therefore 100 per cent. The next sector is our group of 79 cities ranging from 500,000 down to 100,000 population. On the average 78 cities were covered by reports in the first 9 months of 1936 and the population coverage is 99 per cent. The 3rd sector comprises the 98 cities of 100,000 to 50,000 population. The coverage is 97 per cent and we can therefore summarize by saying that

we are getting very comprehensive reports for all cities over 50,000. But bear in mind that these cities contain only about 35 per cent of our population. The fact that they account for almost 69 per cent of all homes reported built this year should at once put us on our guard

It is when we start analyzing the 4th sector—cities between 50,000 and 25,000—that we get the first glimpse of inadequate coverage. There are 185 of these cities but only 159 on the average are being reported in the Dept. of Labor's building tables. The coverage of population is 85 per cent, which means we are in the dark as to the building activity of the remaining 15 per cent.

In the 5th sector, cities between 25,000 and 10,000, we only have 71 per cent coverage. But it is when we get below the 10,000 population line that our troubles really begin. Until the beginning of 1936 no building information at all was published for cities below 10,000. This sector is of special importance because these small cities and towns are not necessarily in the strictly farming districts. Many such centers are suburbs of big cities and it is just such small suburban cities that account for a disproportionately large volume of our home building.

The building information we are getting for cities between 5,000 and 10,000, must be regarded as no more than an important sample of what is happening in the sector. Only 40 per cent of the total population is covered. As we get to the even smaller cities and

*Reprinted from an article by the same title published in American Builder for January, 1937.

NEW HOMES BUILT IN FIRST 9 MONTHS OF 1936								
Estimated from data by Division of Construction, U.S. Dept. of Labor, except where shown by star (*)								
Sector	Number of Cities		Population			Number of Homes Built		
	In Entire Sector	Covered by Reports	In Entire Sector	Covered by Reports	Percentage Covered	As reported for population covered by reports	Per Million People	Estimated Total after Adjustment for population not covered by reports
1. Cities 500,000 and over	14	14	21,315,411	21,315,411	100	51,373	2,410	51,373
2. " 500,000 to 100,000	79	78	15,010,325	14,860,325	99	25,522	1,718	25,707
3. " 100,000 " 50,000	98	95	6,493,448	6,318,427	97	9,603	1,320	9,866
4. " 50,000 " 25,000	185	159	6,485,699	5,445,027	85	9,447	1,739	11,175
5. " 25,000 " 10,000	606	423	9,097,220	6,469,976	71	15,653	2,419	22,006
6. " 10,000 " 5,000	651	262	5,897,156	2,381,099	40	9,323	3,916	23,099
7. " 5,000 " 2,500	1,322	374	4,717,590	1,329,750	28	5,199	3,879	18,301
SUB - TOTAL	3,155	2,165	68,954,823	58,134,015	84	126,090	2,170	164,601
8. Incorporated places below 2,500 population	13,433		9,183,453	0	0		3,000	27,549
9. Rural territory			14,656,770	0	0		561	25,020
1937-1938 U.S.			102,798,046	58,134,015	47	126,090	1,711	214,172

towns from 5,000 to 2,500 the "sample" becomes still smaller—only 28 per cent of the population is covered.

Adjustments for Uncovered Areas

This covers the urban United States with its 1,465 cities over 2,500 and aggregate population of 68,954,823. As the reported cities vary slightly from month to month, we must use certain averages, but we can sum up by saying that 126,090 homes were reported built in this area in the first 9 months of 1936.

But as we have seen, these 7 urban sectors are reported in varying degrees, ranging all the way from 100 per cent coverage for cities over 500,000 to a mere 28 per cent coverage for the smallest cities. Obviously



we must make adjustments and the first step is to figure the per capita building in the "covered" sector so we can apply the same per capita ratio to the uncovered portion of the sector. Here, then, is the first important element of guess.

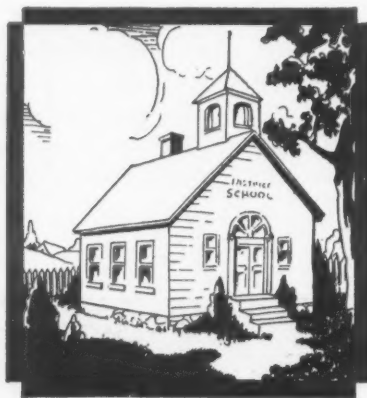
The first sector requires no adjustment, as homes built in cities over 500,000 are reported 100 per cent; but in the 2nd sector the schedule shows that 25,532 homes were built and that it is covered 99 per cent by permit reports. This requires a very trivial adjustment but gives us an opportunity to show the method we employ. 1,718 homes were built per 1,000,000 people and if we apply the same ratio to the uncovered 1 per cent of the sector's population, it raises our number of homes built from 25,532 to 25,787. We have applied this method in all 7 urban sectors and the element of guess grows with each sector. When we get to the smallest and least adequately covered cities—comprising cities between 5,000 and 2,500 population, the element of inaccuracy is very large. Only 28 per cent of the population is covered by permit reports which show 3,879 homes built per million people. We are justified in applying this ratio to the remaining 72 per cent of the sector's population only if we feel that the home building data for the covered 28 per cent of the sector is a good representative cross section of the whole. By applying the ratio, we come to the conclusion that around 18,301 homes must have been built in this 7th sector instead of the 5,159 reported.

In total, then, 126,090 homes were reported built in the 7 urban sectors. By the time we have made adjustments allowing for inadequate coverage, this figure becomes 161,601. Therefore we can assume for the moment that roughly that many new homes were constructed in the urban United States in the first 9 months of 1936.

Estimating Rural Construction

But the urban area is only 56 per cent of our total population. Our troubles begin as we invade the 13,433 incorporated small centers below 2,500 population in which 9,183,453 of our people reside. A great many of these small centers are of course in the farming districts but many others are really suburban to much larger cities. As farm income has risen very rapidly in this and recent years and as home building has been disproportionately great in the smallest suburban cities, we can perhaps assume that building activity in this sector was not so very much below that of the cities between 5,000 and 2,500 population. In the latter, home building this year has been at a rate of 3,879 new homes per million population for 9 months. If we assume 3,000 new homes per million in our 8th sector—and this is a mere guess—we get a total of 27,549 additional new homes which we must add to our 161,601 homes built in the strictly urban section.

We have remaining one more sector, the rural section of the United States with its 44,636,770 people. No one knows the volume of construction here within even a very rough degree of accuracy. We have to fall back on certain figures from the Bureau of Agricultural Economics which has estimated the total expenditures on farm buildings and repairs on buildings for the 5 years 1930 to 1934 at \$675,000,000. No figures are available as yet for later years. Neither is there anything to guide us as to the distribution of this amount. How much was for barns, silos, sheds and



how much for homes? How much was for repair and how much for new construction? We must guess. If we deduct one third for barns and non-home structures we have left \$450,000,000 which farmers spent in five years on homes.

Farmers Spend 28% As Much On Home Building

But it is interesting and instructive to compare this record of \$450,000,000 spent by 44,636,770 farmers on homes with residential construction in urban areas. There is a group of 257 cities with very nearly the same population—44,850,467 to be exact—for which we have a great deal of building information. In the same 5 years in which the farmers spent roughly \$450,000,000 on homes, these 257 cities spent \$1,612,207,847

on residential construction. That is, the farmers spent 28 per cent as much as the urban dwellers. Perhaps it is a fair assumption that this ratio has not changed much in 1936. These 257 cities are all over 25,000 population and in this urban section 2,004 new homes were built per million people in the first 9 months of 1936. If we assume 28 per cent of this ratio for the farmers, the latter built 561 homes per million. And as there are 44.6 million farmers, we get an estimate of 25,020 new homes built by our farm population in the first 9 months of 1936. In grand total we now get an estimate of 214,170 new homes for the whole United States. But we are not through with estimating.

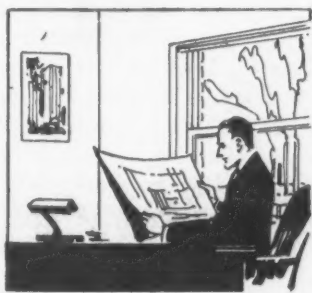
Adjustments for Population Growth

First of all, our population figures are all as of 1930, taken from the census. Since then our population has increased approximately 5 per cent. As our estimates, except in those sectors which are adequately covered, are based on "per million of 1930 population" figures, we may raise the number of homes built in certain sectors by the increase in population since 1930. The average works out at 3.8 per cent rather than 5 per cent. Increasing our grand total by 3.8 per cent we now get 222,308 homes for 9 months of 1936.

The next step is to estimate the homes that were built in the last 3 months of this year, as Dept. of Labor figures are not available beyond September. Experience with building permits in the past has shown that very roughly the first 9 months account for 76 per cent and the last 3 months for 24 per cent of an entire year's home building. This is based on groups of cities above 25,000 and to a lesser extent on additional cities of over 10,000. Our figures include for the first time cities below 10,000 for which we have as yet no seasonal factor thereby adding an additional element of guess. But assuming that 24 per cent is a fair ratio, our estimate of 222,308 homes built in 9 months rises to 292,510 for the entire 12 months of 1936. It is well to add a few more thousand homes to take care of those built in recorded areas but requiring no permits and call it 300,000.

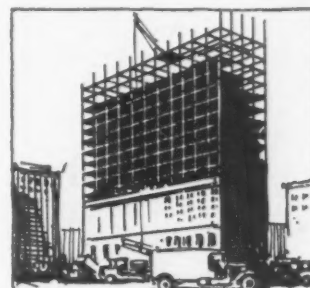
Permit Figures vs. Dodge Contract Reports

So we have finally worked our way through many a guess and estimate to a grand total of 300,000 new homes built in 1936. How are we going to check this



figure? The other source of information is F. W. Dodge reports. They record contracts awarded for 65,845 new single family houses in the first 9 months

of 1936. Also 2,009 two family houses which means 4,018 homes and 30,662,000 sq. ft. of apartment house space. The latter must be converted into number of homes. We use the figure—650 sq. ft. per apartment home, thereby adding another element of guess. This gives us 47,172 new apartment homes. Adding up the 3 types of homes we get a total of 117,035 for 9 months in 37 states. How about the 11 Western States not covered by Dodge? Population would require us to increase the above figure by about 11 per cent; but building activity is rather a matter of growth from expected future population than existing population. Permit figures by geographical zones show that home building per capita was much more active in the West in 1936 than in the country as a whole. The



per capita construction in fact in the West was 64 per cent higher than in the remainder of the country. It seems therefore that we must raise the Dodge figures by 18 per cent instead of 11 per cent to cover the West and allow for its disproportionate home building. This gives us an estimated total of 138,101 new homes in the 48 states for 9 months. Using a seasonal factor based on Dodge figures, about 76 per cent of a year's home building comes in the first 9 months and 24 per cent in the last 3 months. Applying these seasonal ratios, we get a rough estimate of about 182,000 homes contracted for in the entire United States in 1936.

How are we going to reconcile the above figures—300,000 homes derived from Dept. of Labor data and only 182,000 based on Dodge? The first point is that accuracy is strongly in favor of Dodge in the 37 states. Dept. of Labor data are based on permits which are more in the nature of intentions to build than actual commitments such as the contracts recorded by Dodge. All permits do not become actual buildings. Cancellations enter the picture and we have no record of them.

Births, Marriages and Houses

It is my opinion that we must compromise between the two estimates. I would say the number of homes built in 1936 is considerably greater than Dodge showed but also considerably smaller than estimates based on Dept. of Labor data. I would sum up by saying that the irreducible minimum of homes built in 1936 was around 215,000 and that it is quite possible we built as high as 275,000. Perhaps 260,000 is a workable figure.

Many people estimate the number of new homes required annually by using the *present* rate of growth of

population which is between 800,000 and 900,000 annually in this decade. But as this writer pointed out in an article entitled "The Housing Shortage" published a few months ago, the following is the true situation:

The number of new homes required in any given year such as 1936 is dictated by the number of people reaching marriageable age (around 24 or so) in that year. People of that age were of course born around 1912 and it is the rate of increase at that time and not in the present year 1936 that is to the point.

Our rate of population growth is slowing down rapidly but the effects will not reach the demand for homes in full force for quite some time, except for the number of rooms per house which is determined by the size of the family at the present time. There is a time lag between declining population growth and its impact on the demand for homes. For instance from 1920 to 1924 we grew at the rate of 1,800,000 per year be-

Population Change

cause of immigration and a higher birth rate than today. The people born at that time (less death rate) will reach marriageable age around 1944 to 1948, at which time our rate of increase will be no more than 800,000 per year (a full million less) if that much. From 1944 to 1948 we will therefore have a very large contingent of young people ready to marry and looking for new homes, but they will be the product of a very high rate of population increase that will have ceased to exist in 1944 to 1948.

When we recollect that, on account of the disproportionately large contingents of young people who are now reaching marriage age, we require at least 350,000 new homes to take care of new families—we get some conception of the piling up of shortage in home space. As at least 50,000 homes should have been built to replace destruction, 1936 probably increased the shortage figure by 140,000 homes without allowing a single new home to replace antiquated and inferior or destroyed dwellings.

We should not forget that a certain part of the 3,000,000 home units erected in 1925 to 1936 were built not for growth of population, but for replacement of homes destroyed by fire, flood, hurricanes, tornadoes and earthquakes. How many of such destroyed homes were there?

This again is largely a matter of guess, but fire loss data shows that approximately \$150,000,000 of dwellings are destroyed by fire on the average per year in non-rural areas alone. This roughly works out at 35,000 homes. We can easily add another 35,000 per year to cover farm houses burnt and homes in farms and cities destroyed in other ways than fire. This gives a total of around 700,000 homes built in the above 10 year period, not for growth of population, but to make good the ravages of fire and natural calamities.

In our calculation, we have not allowed for any replacement of homes except those destroyed by fire and natural calamities. As the Real Property Inventory

in 64 cities showed, 2.2% of all dwelling units were recorded as unfit for human habitation and 15.4% required major structural changes to make them safe and livable according to the survey investigators. If we assume 31 million home units as existing throughout the entire country and apply the above percentages, we would have to assume that 682,000 homes should be replaced at once and that over 4,774,000 home units require major structural changes. If we take these figures at their face value, it would seem we now have a total direct shortage of around 1,900,000 homes (1,200,000 plus 682,000) and that almost 4,800,000 homes must be altered so drastically that they will practically become new homes. If we add these together, it might be said we are short 6,700,000 new or rebuilt homes.

It must not be forgotten that a new home is one of the most postponable of all wants. Almost everyone already has some kind of a home. A person may live in the poorest slum, be doubled up with in-laws or strange families and no doubt would very much like a new home, but that is very far from being an actual effective commercial demand for a new home. If the home is not actually ready to fall apart, it is still serviceable in the sense that it at least provides shelter and the dwellers cannot or will not place an order for a new home or move into a new home built by others until their economic status has improved sufficiently and other more immediate wants have been satisfied.

Forecast for 1937

And now—how many homes will we build in 1937? In view of the difficulty we have in estimating actual construction in 1936 it seems like sheer foolhardiness to venture into

a future year. Nevertheless we can make some shrewd guesses.

We can probably take for granted that 1937 will be a year of continuing recovery, the home shortage is a fact, mortgage money exists in superabundance for safe prospects at a rate of interest that is lower than in our great building boom days of the past, rents are rising, so are incomes, but building costs are climbing.

The trends of business are up, but they do not climb continuously upward at constantly the same rate of growth. A chart showing the trend of residential construction in 37 states as recorded by Dodge has a steep trend in 1935 and a decided slackening in trend in 1936. In other words the rate of growth in home building that existed in 1935 as compared to 1934 was not maintained into 1936. If it had been, the Dodge figures for entire 1936 would show around 370,000,000 sq. ft. of residential construction instead of perhaps around 230,000,000. Because a year's home building is double its predecessor's, it is foolish to assume that a coming year will necessarily also double the volume of the preceding year. Such rates of increase never go on forever. I do not believe 1937 will double the volume of 1936 although the theoretical demand is certainly there. I think however we have a right to use 425,000 new homes for 1937 as a rough workable figure.



Pattern Development for Forced Air Fittings

This article is the first of a series which will cover practical methods for developing and cutting the patterns for fittings and typical sections used in small ventilating, residential air conditioning and forced air heating systems. In order to make the series a usable manual, the editors invite requests for special fittings to be transmitted to the author.

By William Neubecker
Head Instructor,
Sheet Metal Department, New York Trade School

THE series of articles which will follow will treat the various methods for developing and constructing the many types of fittings used in practice. Short, simplified rules will be given as well as the true geometrical methods for developing the more complicated fittings which arise in practical work.

Where it is possible to do so, the patterns will be laid out so that the Pittsburgh lock can be employed. Where fittings have compound curvatures and it is not possible to have straight lines in the heel and throat patterns, then the corners must be double seamed. In designing the shape of any fitting, care must be taken not to reduce the given area, but to have the same area throughout the entire fitting and to draw easy, frictionless radii or angles, to facilitate the flow of air. The same applies where branches are taken from the main duct. A single duct feeding two or more smaller ones must have a capacity equal to the combined capacity of all ducts supplied by it. While there are many styles of fittings which can be purchased, it is to the advantage of the mechanic to understand the method for developing the various pattern shapes, a knowledge of which will enable him to lay out the many odd fittings required in different building constructions.

Construction Features

Before proceeding with the pattern shapes, a few words on the constructive features for ducts, stacks and their "slips" or connections, may not be out of place. As a rule on large contracts, the ducts and stacks are made up complete in the shop. When the job is at a distance or on residential work, the ducts and stacks can be made up on the job, by using side rails of the required *depth* formed up in the shop as shown in Fig. 1, where the side rail is indicated with the Pitts-

burgh lock at "A." Knowing the required *width* of the duct the top and bottom of the duct can be made from flat sheets on the job. One quarter inch right angular edges are bent on each side as shown on the top *B*, then inserted in the groove at *A* on the edge *a* hammered over as shown at the bottom *B'* at *b*. The duct can also be made in two parts in the shop (when the *width* of the duct is known) as indicated in the diagram at the right, where *C* is turned down as at *D* when assembling at the job.

Cross Joint "Slips"

When the ducts are connected at the cross joints, any one of the five slips shown in Fig. 2 can be used. The slip in diagram *E* is the usual "S" slip employed. After connections are made, round head metal screws are used to join the five thicknesses of metal, one being shown at *c*. *F* shows another type of rigid "S" slip having a standing edge about $\frac{3}{4}$ inch high. This holds the shape of the duct rigid all around. Round head metal screws indicated by *d* are screwed through the five thicknesses of the metal every 12 inches apart.

A clinch "S" slip is shown in diagram *G*. Note the formation of the slip from *e* to *h*, which is riveted to the lower joint of duct at *e*. The end of the upper duct is flanged out to fit in the pocket at *f*, after which the flange *h* is turned down tight as shown by the dotted line.

Diagram *H* shows a drive cleat. In the joint both ends of the duct have a half inch lock turned on same, into which the drive cleat is driven thus drawing the two ducts together at *i* and *i*. Diagram *J* shows the formation of a rigid drive cleat with a double standing edge *J*. This type makes a neat looking joint when the corners are mitered.

Collars which connect to the plenum chamber or

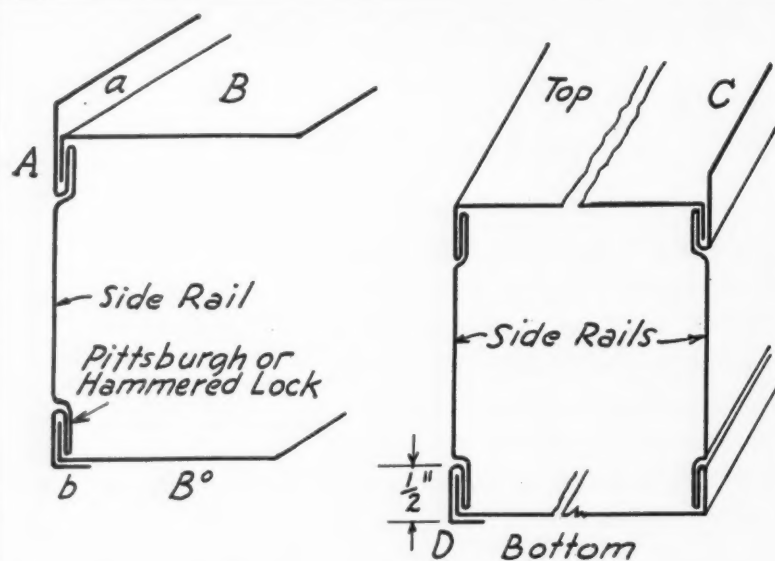


FIG. 1-DUCT CONSTRUCTION

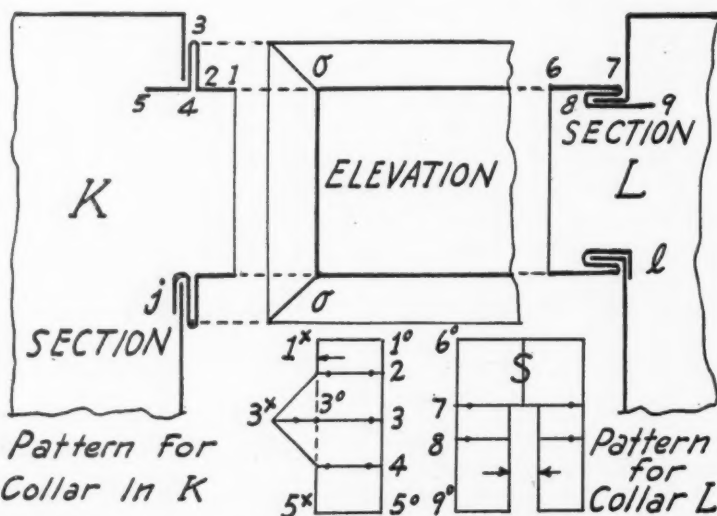
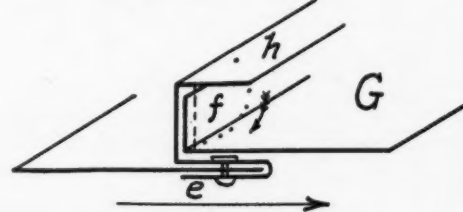
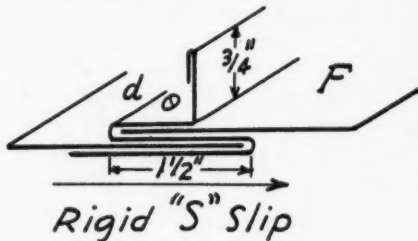
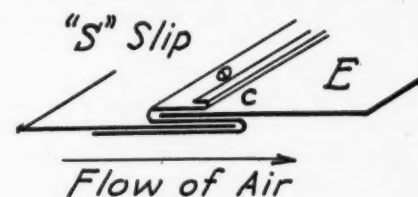
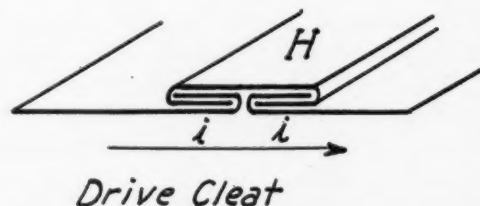


FIG. 3-COLLAR CONNECTIONS TO PLENUM CHAMBER OR DUCTS.



Clinch "S" Slip



Drive Cleat



Rigid Drive Cleat

FIG. 2-CROSS SEAM SLIPS OR CONNECTIONS.

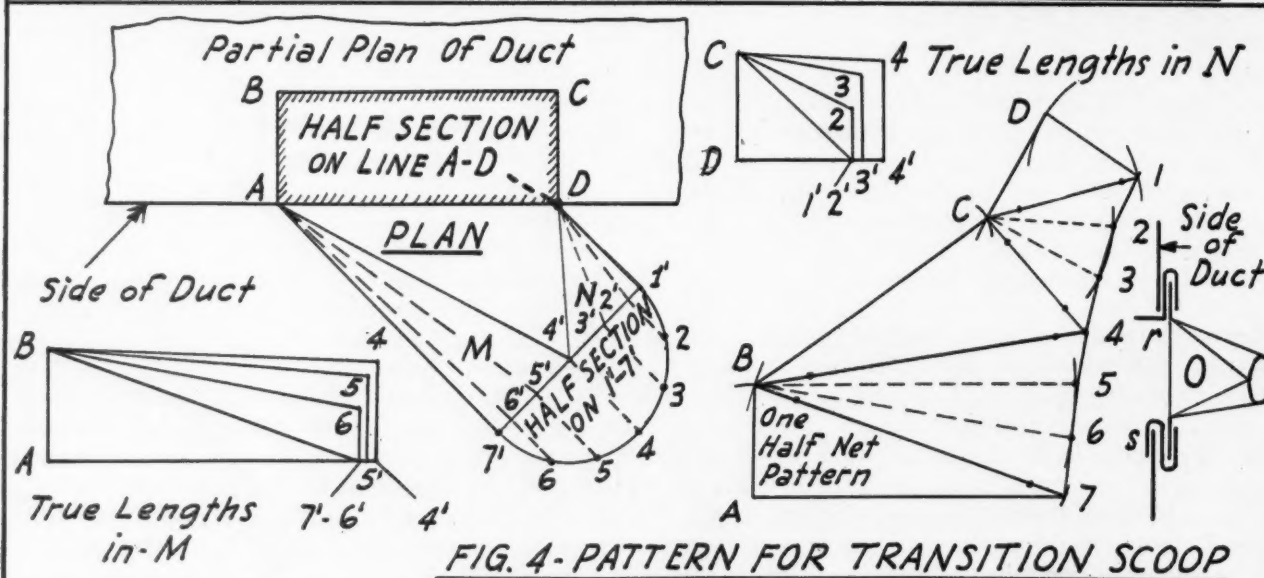


FIG. 4-PATTERN FOR TRANSITION SCOOP

ducts can be constructed as shown in Fig. 3. One connection is shown at *K* with the formation indicated from 1 to 5, thus allowing the flange to be clinched as shown at *j* below. If the flange 2-3-4 is to be mitered as at *o-o* in elevation, the pattern is laid out as shown below. Take the girth from 1 to 5 and place it on the lower vertical line $1^{\circ}-5^{\circ}$ and draw the usual measuring lines to the left as shown. Now take the width of 2-3 or 3-4 both being the same and set it off from 3° to 3^x on the line $3-3^x$ and draw the miter cuts as shown. Knowing the size of the collar, use this stub pattern and always measure from the arrow point, reversing the stub pattern for the opposite side. Use this same pattern for any size collar. If no miter joints are required, then simply draw a line from 1^x to 5^x and measure from arrow as before.

Collar Connections

Another connection is shown in section *L* also in Fig. 3. Here, instead of the chamber or duct having a raw edge opening as in section *K* it has a standing edge as shown. The formation of the collar can be made as indicated from 6 to 9 and then clinching 9 under the standing edge as at *l* below.

The pattern for a collar of this type is shown below, where the girth $6^{\circ}-9^{\circ}$ is obtained from 6 to 9 in the section. To allow for the thickness of the locks at 8 in the section, set off this thickness on either side of the corner bending line *S* as shown and make this notch at each corner, so that when the collar is bent on the corners there will be sufficient play for the locks, without causing the metal to buckle. The measurement must always be taken from the arrow points on the notched lines when laying out the full size collar.

Transition Scoop

The pattern for a fitting known as a transition scoop is shown in Fig. 4. This is a transition rectangular to round and connects to the sides of the rectangular duct transferring the flow of air from the duct to a round pipe. A damper plate is usually inserted at the intersection *D* shown in the partial plan of duct which will guide the desired amount of warm air into the round pipe. The partial plan view of the duct is shown with the scoop taken off at an angle of 45° .

In developing the pattern shape a *simplified* method will be employed *without* the use of an elevation. In its proper position draw the plan view of the transition scoop $A-D-1^{\circ}-7^{\circ}$. On the line $1^{\circ}-7^{\circ}$ draw the semi-circle as shown and divide in equal space from 1° to 4 to 7° . At right angles to the duct line from intersections *A* and *D* erect the perpendiculars $A-B$ and $C-D$ making each equal to *one-half of the height* of the rectangular opening cut in the side of the duct to receive the transition. Then $A-B-C-D$ represents the half section on the line $A-D$ and $1^{\circ}-4^{\circ}-7^{\circ}$ the half section on the line $1^{\circ}-7^{\circ}$. From points 2 to 6 at right angles to $1^{\circ}-7^{\circ}$ draw line to intersect $1^{\circ}-7^{\circ}$ as shown. Points of intersections obtained on line $1^{\circ}-7^{\circ}$ from 2 to 4 are drawn to the corner *D* while those from 4 to 6 are drawn to corner *A*. These lines then represent

the bases of sections to be constructed whose altitudes will equal the various height in both half sections.

For example, to find the true lengths in *M* in plan take the various lengths $A-7^{\circ}$, $A-6^{\circ}$, 5' and 4' and set them off on the horizontal line shown in the lower left corner as indicated by similar numbers. From *A* erect the line $A-B$ equal to $A-B$ in the half section. In similar manner from points 6', 5' and 4' in the true lengths *M* erect the perpendiculars 6, 5 and 4 equal to the distances 6, 5 and 4 in the half section measured from the line $1^{\circ}-7^{\circ}$.

From *B* in the true lengths *M* draw lines to 4-5-6 and 7' which represent the *true lengths* of similar numbered lines in *M* in plan. In precisely the same manner obtain the true lengths in *N* as clearly shown in the upper right diagram.

Having found the true lengths, the pattern is now in order. Take the distance of $A-7^{\circ}$ in *M* in plan and place it on any line as $A-7$ in the half pattern. With 7 as a center and $7^{\circ}-B$ in the true lengths *M* as radius, describe an arc which is intersected by an arc struck from *A* as center and $A-B$ in the half section as radius. Draw a line from *A* to *B* to 7 in the half pattern. Now with radii equal to $B-6$, 5 and 4 in the true lengths in *M* and with *B* in the half pattern as center, draw the arcs 6, 5 and 4. Set the dividers equal to the division between 7' and 4 in the half section, and starting from 7 in the half pattern step to arc 6, 5 and 4 and draw a line from 4 to *B*. With $B-C$ in the half section as radius and *B* in the half pattern as center, describe the arc at *C*, which is intersected by an arc struck from 4 as center with radius equal to 4-*C* in the true lengths in *N* diagram.

Scoop Pattern Development

From similar diagram use as radii $C-3$, 2 and 1° and with *C* in the half pattern as center draw arcs 3, 2 and 1. Set the dividers equal to the spaces between 4 and 1° in the half section and step off from 4 in the half pattern to arcs 3, 2 and 1. Draw a line from 1 to *C*. With $C-D$ in the half section as radius and *C* in the half pattern as center draw the arc *D* which is intersected by an arc struck from 1 as center with radius equal to $1^{\circ}-D$ in *N* which is similar to $1^{\circ}-D$ in plan. Draw lines from *C* to *D* to 1 in the half pattern and draw the arc through intersections previously obtained from 1 to 4 to 7. $1-7-A$ to *D* then represent the one-half pattern shape. The heavy lines in the pattern indicates where slight bends are to be made.

Seaming edges must be allowed along $D-1$ and $A-7$ if the transition is made in two pieces. A seaming edge must also be allowed along the curve $1-7$ on which the collar is seamed. When joining the transition scoop to the side of the feed duct, the following makes a rigid job. Allow a half inch flange along $A-B-C-D$ in the half pattern, then use the collar pattern for *K* in Fig. 3 but omit the flange $1^{\circ}-2$, that will make the collar, when bent up, to look like 2-3-4-5 in section *K*. Lock this formation to the half inch flange of the transition scoop as shown in diagram *O* in Fig. 4, clinch tight, set the projecting flange in the side of the duct as shown at *v* and clinch again as shown at *S* below.

The 1937 "Home Market"—

Our Greatest Potential Sales Field

WITH money to buy more generally distributed than for many years past, supplemented by a desire to build or buy things long postponed and with contractors everywhere laying plans to satisfy these desires it may be profitable for contractors to study the field in which they expect to operate—especially the "home field"—the greatest single source of present and future business.

This "home market," prior to 1934, was a picture circumscribed for most contractors by the intimate knowledge of the owners and their homes in the contractors' immediate operating area. What the market was 100 miles from home, or even 25 miles, was only a hazy mirage. Some large companies, operating throughout several states or nationally, had made surveys, but the findings and conclusions were projected from a very limited number of samples.

Then in 1934 the Department of Commerce published the Real Property Inventory in which 64 cities of all sizes and characteristics were practically 100 per cent surveyed, giving industry for the first time a comprehensive study of the American home and its owner. The figures disclosed by this survey form the basis for this analysis.

These charts are practically self explanatory. The picture we get might be summed up like this—

The average American home is a single family dwelling about 19 years old, of wood or frame construction and contains five rooms. It is equipped with a bath tub or shower, indoor water closet and uses electricity for lighting and gas for cooking. For the country as a whole reliance is placed predominantly on heating stoves for heat, but *31 per cent of all dwelling units uses warm air furnaces*. Coal is the principal fuel used. Forty-four per cent of all houses need repairs.

This composite home is built up from the charts as follows: As shown in Chart 1, 15.2 per cent of all houses have a value from \$2,000 to \$3,000; 24.7 per cent have a value from \$3,000 to \$5,000; 14.5 per cent have a value from \$5,000 to \$7,500. The only other large group is that with a value from \$1,000 to

\$2,000—13.1 per cent.

Chart 2 shows that 79.6 per cent of all houses are single family units, the only other classification showing a considerable percentage being two-family dwellings which includes flat buildings and remodeled houses.

Due to reduced income and other exigencies, 37.6 per cent of the houses are in good repair while 44.6 per cent need minor repair and 15.4 per cent require major structural repairs. This is shown in chart 3. Minor repairs include such betterments as painting, new heating plants, repair of roofs or new roofs, gut-

ters; in other words betterments which can be made without structural change.

Chart 5 is of interest principally when used with chart 3. Chart 3 shows that age groups are pretty well distributed with 19.2 per cent of all houses being 5 to 10 years old, 25.8 per cent being 10 to 20 years old, 18.1 per cent from 20 to 30 years old and a surprising number—22.1 per cent—from 30 to 50 years old. When we consider that over 80 per cent of all houses are of frame construction we must conclude that frame construction is not as short lived a construction as some would have us believe. This predominance

of frame construction is shown in chart 6 which shows over 82 per cent of all houses to be of frame construction and although not shown in the chart only a negligible percentage of these frame houses are insulated.

In chart 7 we find the types of heating systems in use today. Although it may surprise some readers, the fact is that 42.4 per cent of all homes are still heated by stoves. Of course this includes all the rural homes and hundreds of thousands of small cottage of the low income groups.

The only other type of heating which shows predominantly is warm air furnaces with 31.1 per cent. The total percentage of all other types of heating bulked together do not equal warm air furnaces in number.

Lastly in chart 8 we see that coal is the selected fuel for almost three-quarters of all home owners.

If we project the facts shown on the chart into potential sales markets we have these possibilities:

1. The enormous predominance of frame construction means a tremendous market for insulation.
2. With almost one-third of all heating equipment being warm air furnaces the market for betterments in the way of mechanical circulation, humidification, filters, control systems on up to air conditioning is tremendous without getting outside our own type of heating.
3. The large percentage of stove heated houses means that central heating, designed and priced for low income groups and for installation in less than good construction offers another market as large as the market already developed.
4. Automatic heating with special fuels or special firing devices for solid fuel have hardly begun to scratch the home market.
5. The field of repair and betterment is by itself large enough to keep the construction industry busy for many years without any new construction.

FACTS ON THE NATION'S HOMES *

From The Real Property Inventory In 64 Cities

VALUE OF DWELLING UNIT
(Own-Occupied Units Only)

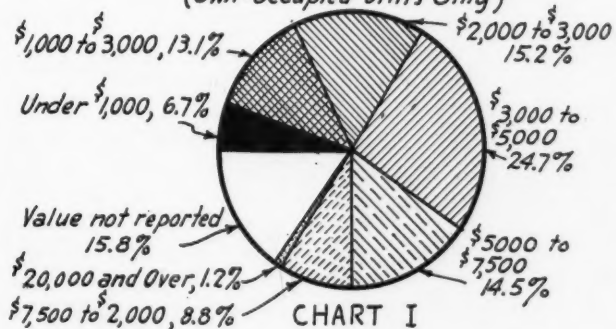


CHART I

AGE OF STRUCTURE

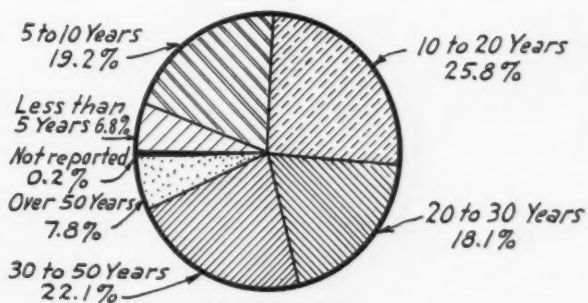


CHART-V

TYPE OF STRUCTURE

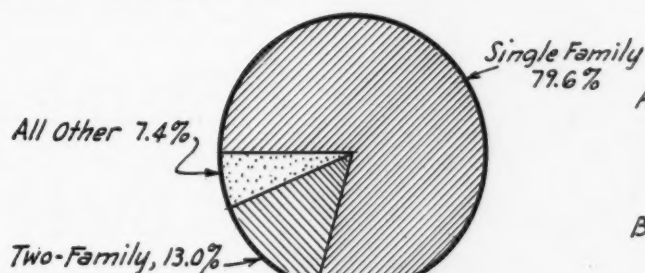


CHART- II

PRINCIPAL MATERIAL OF CONSTRUCTION

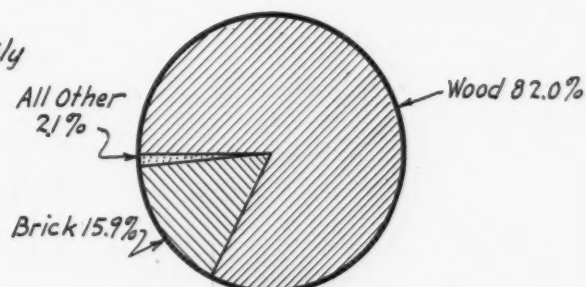


CHART-VI

CONDITION OF STRUCTURE

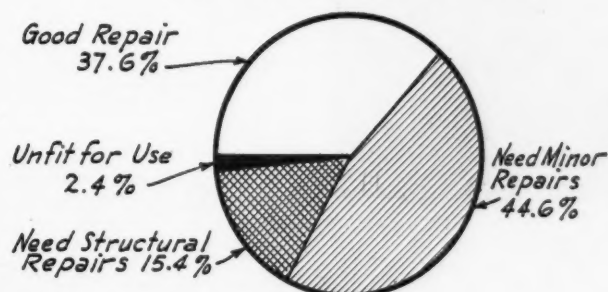


CHART- III

TYPE OF HEATING APPARATUS

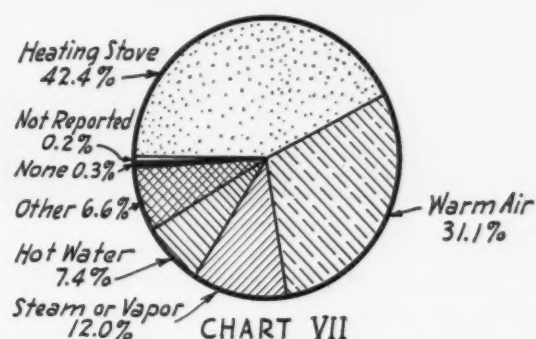


CHART VII

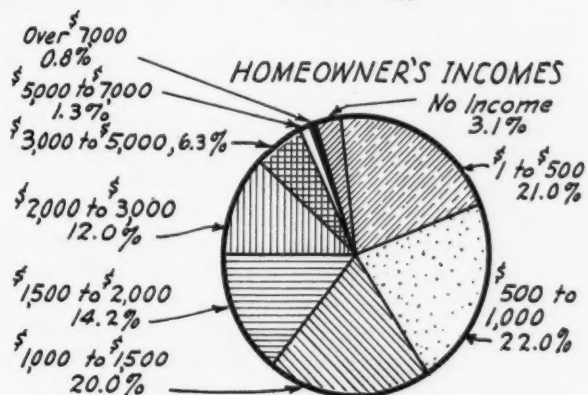


CHART- IV

PRINCIPAL FUEL USED
(For Heating)

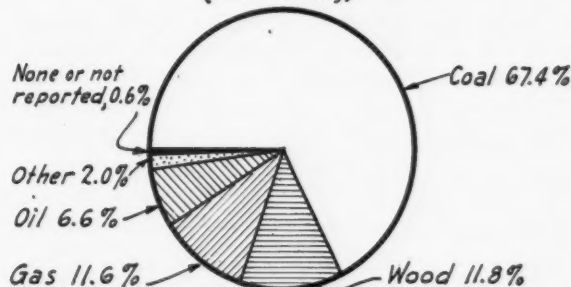


CHART- VIII

* These Summary Totals are Based on Reports for 64 Cities covered in the Real Property Inventory, Conducted by The Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C.



*Photo by courtesy of Republic Steel Co.,
from the moving picture "Enduro"*

Arc Welding Stainless Steel

By
J. Carl Wilson

BRIGHT metals is a subject about which a good sized hand-book could be written, but space will permit us to deal only with the more important factors of welding stainless steel.

One of the first and most important considerations in selecting bright metals for ornamental or exterior building purposes, either welded or otherwise, is the gauge. Under no circumstances should metal less than 20 B. & S. gauge be used. Most contractors have seen the results of using too light a metal gauge and many times have said of a job—"a rotten mechanic did that." We forget that the best mechanic in the world can not take the poorly selected metal and make a good job.

It is well to repeat again—if the architect has specified a metal that is too light, go and talk to him and tell him that bright metals will show fabrication defects quicker than any other kind of finish, but—if the metal is heavy enough not to buckle and show unevenness—

it is one of the most beautiful finishes for the exterior of buildings.

There is much evidence today that popularity of bright metal offers an opportunity for the sheet metal contractor to re-establish himself in the architectural field. For a long time, with the passing of cornice work, it seemed that modern building design would almost completely eliminate the sheet metal contractor, but as many of us know the introduction of bright metal has put new life into our industry, and put larger figures on the black side of the ledger for the firm that makes the proper study of this metal and can fabricate and erect the kind of work that will meet architectural approval.

The author's experience has been restricted to the west coast, but architects and owners contacted here show a decided interest in and in many cases a preference for stainless steels.

In most cases where a poor opinion of bright metal existed it was because of a poor job where too light a metal gauge produced a weavy effect that spoiled the appearance completely. The intelligent contractor should feel it a part of his services to re-detail any architect's incorrect details. Though this requires the facilities of a drafting room plus the ability to visualize the architects' ideas such service will result in winning the confidence of the owner and getting a reasonable price for the job.

Concealed Fastenings

There is no set formula for concealed fastenings as structural conditions vary greatly. Screws should not be used on the face if it is possible to eliminate them, as screws go a long way to spoil the job. A spot welder is one of the best methods to attach the fastenings to the back of the sheet. Care must be taken to have the points in good shape so as not to mar the front with pits or arc holes. If points are kept in good shape a perfect job can be obtained and the concealed fastenings are really concealed.

Analysis and Weldability of Stainless

There is on the market a very large variety and number of stainless steels. These have various qualities and are of various chemical content, however the most frequently met with is the commonly called 18-8 stainless. It derives this designation from the fact that it

contains approximately 18% chrome and 8% nickel with a small fraction of a percentage of carbon. Generally in this type of steel the alloy will be within the following ranges; chrome 16.5% to 19.5%; nickel 7% to 10%; carbon not over 20%.

Welding Procedure

For welding these steels a low carbon content is desirable since the heat of the arc may cause the carbon to precipitate out of solution near the fusion zone, thus decreasing the corrosion resistant qualities of the base metals. Arc welding of 18-8 steel should always be done on a smooth or scale-free surface to avoid oxidation from this source. After welding, there will be noticed discoloration on each side of the weld; this should be removed by grinding or pickling or some similar means if maximum corrosion resistance is to be obtained.

The coefficient of expansion of the 18-8 alloys is approximately 50% greater than mild steel. In setting up any job for welding this must be taken into account and allowance made for contraction and expansion. Edges should be clamped parallel the same as for ordinary steel. A heavy coated electrode that produces a good shield arc should be used for best results in welding 18-8 alloys. The metal case of the electrode should be of the 18-8 group with low carbon content (not over .07%) to prevent carbide precipitation. Reversed polarity should always be used; that is the work should be negative and the electrode positive.

Electrodes and Current

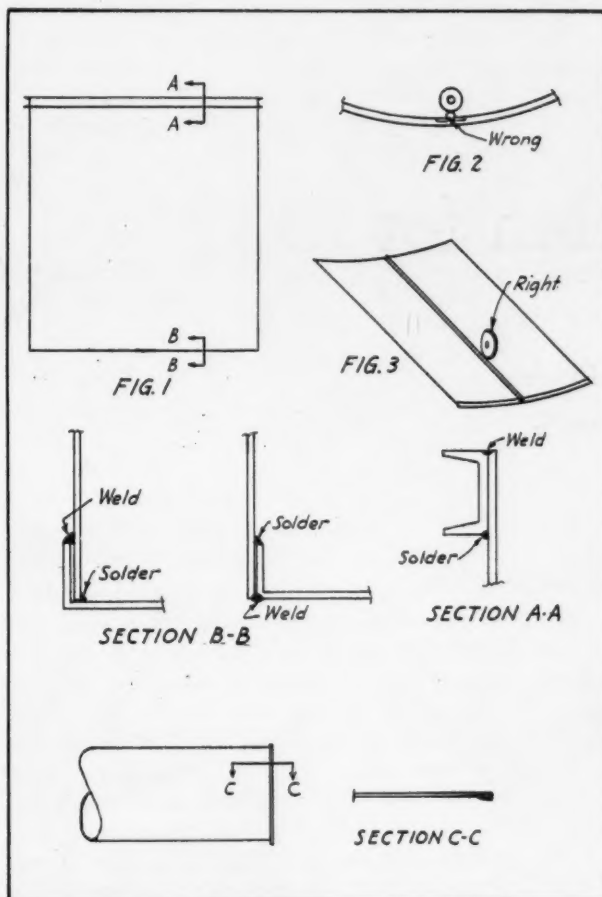
Since stainless steel has a high electrical resistance it is advisable to use short electrodes to avoid over heating the electrode at the holder. Suggested electrode size and current in amperes—3/32-inch 50 to 75 amps; 1/8-inch 75 to 100 amps; 5/32-inch 110 to 140 amps; 3/16-inch 150 to 175 amps. These currents are for horizontal welding. For vertical and overhead welding 3/32-inch and 1/8-inch electrodes are usually used and currents on the low side of those given above.

A Tank Problem

The following illustration demonstrates one of the advantages of welding. Fig. 1, shows a tank to be welded outside and soldered inside. Stainless is almost impossible to solder on the opposite side after welding, owing to the oxidation in the joint. To overcome such oxidation we assemble the tank and solder it on the inside in the place where we can not reach with a grinder. We fill the tank with water about two inches above the joint to be welded and we can weld the joint without melting the solder.

Fig. 2 shows the wrong way to grind an inside weld. Fig. 3 shows the correct way.

Fig. 4 shows method of building up end of thin pipe before welding on to heavier pipe or container. This practice is suggested because any current hot enough to get good penetration on heavy metal will burn holes in the light piece and currents low enough not to burn the light piece will not penetrate deep enough in the heavy piece. By making both pieces heavy we get a sound weld without burning the lighter sheet.



These sketches show procedure for a tank welded on the outside and soldered on the inside. To do this, solder first—fill tank with water—weld outside.

TAX LOAD FOR 1937			
Sales	\$41,991.93	100.00%	
Profit	3,467.71	8.26	
TAXES, STATE & LOCAL:			
Real Estate	\$ 300.00		
Personal Property	112.50		
Franchise	20.00		
Sales Tax	642.85		
Automobile: Gasoline	90.00		
License Fees	25.00		
Wheel Tax	9.00		
Total State & Local Taxes	\$1,199.35	2.85	
TAXES, FEDERAL:			
Gasoline	30.00		
Lubricating Oil	2.00		
Telephone & Telegraph	20.00		
Capital Stock	50.00		
Normal Income Tax	321.45		
Excess Profits Tax	(none)		
Surtax on Undistributed Profits	220.24		
Social Security—Old Age Benefits	160.80		
Social Security — Unemployment Compensation	321.60		
TOTAL FEDERAL TAXES	\$1,126.09	2.68	
TOTAL TAXES	\$2,325.44	5.53%	

As we begin this new year of 1937, the problem of adjusting overhead to include all the new and old taxes each business must write into every sales contract to insure a satisfactory profit, becomes more and more important. Do you realize just how many taxes are now levied against your business? J. G. Dingle itemizes taxes for an Illinois shop—a total cost of staggering proportions.

YOUR Tax Burden for 1937

By Joseph G. Dingle
C. P. A., Ottawa, Ill.

THIS is the time of the year when we are called upon to close our 1936 records—take inventory—and “cast up our accounts,” as our forefathers would say. This year we have the same old problems our grandfathers had and many new ones. Even in Dad’s day we ran our business to suit ourselves, and hardly recognized the heavy (as Dad thought) duties laid upon us in the way of governmental tolls.

In 1913, by Constitutional amendment, the people gave Congress the power to lay and collect taxes on incomes; and since that day Congress has laid tax upon tax and has seen to it that they were collected. And as new taxes were invented by Congress, our State legislatures took an interest in such new develop-

ments and began to try new ideas in tax raising. As a result of these so-called improvements, the tax toll has become increasingly heavy with each passing year.

In an effort to bring out some of these taxes, we here present some figures dealing with an average Sheet Metal Shop in Illinois employing eight or more persons, and in order that ARTISAN readers may better protect themselves in 1937, we have enumerated the taxes which will be laid on a corporation next year.

First, let’s paint a word and figure picture of our shop. It is operated by a Corporation, having Capital and Surplus of \$50,000.00. It owns its building, costing \$20,000.00; has equipment and inventory worth \$5,000.00 and an automobile and two trucks costing

\$2,500.00. Let's assume that for tax purposes, the company gets a break and has its property assessed at a reasonable value:

	Actual Value	Assessed Value	Tax @ \$5.00 per \$100.00
Real Estate	\$20,000.00	\$6,000.00	\$300.00
Equipment and Inventory	5,000.00	1,500.00	75.00
Auto and Trucks.....	2,500.00	750.00	37.50
Totals	\$27,500.00	\$8,250.00	\$412.50

Now, we show in condensed form, the predicted operations for the calendar year 1937.

	Materials	Direct Labor	Total	%
Sales	\$21,428.48	\$20,563.45	\$41,991.93	100.00
Cost of Sales....	12,992.30	12,480.00	25,472.30	60.66
Gross Profit ..	8,436.18	8,083.45	16,519.63	39.34
Overhead			13,051.92	31.08
Profit			\$ 3,467.71	8.26

We may now begin our task of enumerating the many taxes which are to be borne by our shop. We shall first discuss them and later show in Summary Form the aggregate cost of these items.

Real Estate and Personal Property

These are our oldest taxes, and during recent years have, in practically all taxing authorities, been levied at the maximum rates permitted by law. We pay these to the County Collector, and he in turn distributes them to the taxing authorities for which they were levied. It is from this source that the County, City, Schools, Township and all political subdivisions below the State are maintained. The assessed value in Illinois for example, is usually quite low and for our purpose here we are using 30% of real value. The combined rate per \$100.00 of assessed value is around \$5.00. Thus, as will be seen, we have a tax bill of \$300.00 on Real Estate and \$112.50 on Personal Property (equipment, inventory, auto, trucks).

Franchise Taxes

Illinois levies a Franchise Tax of 50c per \$1,000.00 of Stated Capital, and this includes all Capital Stock and Paid in Surplus, but not earned Surplus. We have used as Stated Capital \$40,000.00, and this tax amounts to \$20.00.

Sales Taxes

Illinois levies a Sales Tax of 3% on sales of tangible personal property to consumers. In order that our

Typical Shop may benefit from good records, we have shown our sales under two classifications: Sales of Materials, which are subject to the Sales Tax; and Sales of Direct Labor, which is not subject to this tax. Incidentally, unless billed as separate items, the tax applies on total sales. But, as here illustrated, we are subject to tax on \$21,428.48 at 3% resulting in a tax of \$642.85.

Illinois regulations provide that even though the sale be made at, say, \$100.00 and the \$3.00 tax added, the retailer is subject to tax on the \$103.00, resulting in a tax upon a tax.

Automobile Taxes—State

In Illinois we have a license fee, which was laid to produce revenue for roads. Then, also, for the avowed purpose of road building, we have added a Gasoline Tax of 3c per gallon and recent years have found this gas tax being used for everything under the sun, even including some road building.

We have used \$25.00 as the cost of the licenses for the car and two trucks. On gasoline, we have an estimated 3,000 gallons at 3c, or \$90.00.

We find the average city levying a Wheel Tax on motor vehicles, and have used \$3.00 for each vehicle, or \$9.00.

This exhausts the State and Local Tax list and we now turn to those exacted by the Federal Government.

Gasoline

The Federal Government, finding the Gas Tax quite effective for the states, placed a levy of 1c per gallon, which costs our shop \$30.00 for the year.

Oil

Here we pay, indirectly, 1c per quart on our lubricating oil and our shop thus contributes \$2.00 during the year.

Excise Taxes

When we bought the automobile and the trucks, we paid an excise tax of 2% or 3%. We pay an excise tax of 2½c per pound on tires and tubes. These we have not included in the annual tax bill for the reason that the cars are usable for several years and the tax is not an annual charge.

Telephone and Telegraph

Every telegram sent carries a tax of 5% and every long distance call costing 50c or more carries a tax of 10c, 15c or 20c. For these we



Not only do you pay taxes itemized on the preceding page, but direct and indirect taxes are included in every bill you pay.

have used \$20.00 for the year.

Capital Stock Tax

This is a levy of \$1.00 per \$1,000.00 of declared value on the capital stock and surplus of the corporation. Having used \$50,000.00 as the value of our company, the tax is \$50.00.

Normal Income Tax

Corporations were, in years past, given a specific exemption, but recently this has been removed. In 1937 a corporation is taxed 8% on the first \$2,000.00 of income; 11% on the next \$13,000.00; 13% on the next \$25,000.00; and 15% on all net income over \$40,000.00. Our company, having a net profit of \$3,467.71, will pay \$321.45 as Normal Income Tax. (8% on the first \$2,000.00 and 11% on remainder).

Excess Profits Tax

Having declared a value of \$50,000.00 for Capital Stock Tax purposes and paid a tax of \$50.00, our company is entitled to an exemption of \$5,000.00 (10% of \$50,000.00) for the purpose of this Excess Profits Tax. Net income being less than \$5,000.00, there is no tax due.

But suppose our Capital Stock Tax had been on a declared value of \$25,000.00 and we had paid \$25.00 tax. In that case, our exemption would have been \$2,500.00 (10% of \$25,000.00) and our income of \$3,467.71 would have exceeded the exemption by \$967.71, which would have been taxable at 6% and while saving \$25.00 in Capital Stock Tax, we would have paid \$58.06 as Excess Profits Taxes. But, we have used a declared value of \$50,000.00 and thus saved \$33.06 by so doing.

Surtax on Undistributed Profits

This is a new idea in corporate taxes and appeared for the first time in the Revenue Act of 1936. It is levied on corporations as a penalty for not paying out as dividends to stockholders the profits for 1936 and subsequent years. This tax is at graduated rates, from 7% to 27%, and on account of a specific credit to corporations having income of less than \$50,000.00, this tax will cost our company 7% on its income of \$3,467.71 less normal income tax of \$321.45, or \$3,146.26, if no dividends are paid during 1937. This tax amounts to \$220.24.

Social Security Taxes

Here again we have new taxes. One, effective January 1, 1936, on all employers of eight or more is for 1936, at 1% of total pay rolls and salaries, and for 1937, 2%. In 1938 and thereafter, the tax is levied at 3%. This is the Unemployment Compensation Tax payable to the Federal Government and, in Illinois, our employees get no benefit therefrom, and will not, unless and until we have a State Unemployment Compensation Act, which means more taxes.

We have also the Old-Age Benefits tax, effective January 1, 1937, and for the year 1937 amounts to 1% on total pay roll from employer, and employees pay a like percentage.

Social Security Taxes

For the purpose of these taxes we must use all salaries and wages. We have:

Direct Labor	\$12,480.00
Office Salaries	1,200.00
Officers' Salaries	2,400.00

Total\$16,080.00

For 1937, the Social Security taxes will be:

Old Age Benefits, \$16,080.00 @ 1%	\$160.80
Unemployment Compensation, \$16,080.00 @ 2% ..	321.60

Total\$482.40

We have not attempted to bring out all hidden taxes. Just to mention a few, we pay chauffeur's license fees for our drivers; sales taxes on shop and office supplies; and, of course, *in everything purchased, we pay the seller's tax load in his price.* Then, too, the salaries and wages paid by the company to its workmen and management are subject to income tax; the new property created by the sales becomes taxable property in the hands of the customers, and on that they are taxed.

A Summary

To sum up, we have a tax load which is more or less open and direct, of \$2,325.44 as is shown by the table herewith. To show just how this tax load is borne, we here summarize as follows:

		%
Material Cost	\$12,992.30	30.94
Direct Labor Cost.....	12,480.00	29.72
Overhead (other than Taxes and Salaries)	7,126.48	16.97
Office and Officers' Salaries.....	3,600.00	8.58
Taxes, State and Local.....	1,199.35	2.85
Taxes, Federal	1,126.09	2.68
Profit	3,467.71	8.26

Total charge to Customers, or Sales..\$41,991.93 100.00

How Much Profit?

When we take into consideration the capital investment of \$50,000.00, which, invested at 5% would yield \$2,500.00 per year, or at 6%, \$3,000.00 per year, the profit of \$3,467.71 is quite low, especially when the risks involved are considered. We cannot say, then, that we have overcharged our customers. We can, however, point out quite clearly and conclusively that our customers have absorbed the tax bill—\$1,199.35, or 2.85% to the State and Local Governments and \$1,126.09, or 2.68% to the Federal Government. If the business man knows his costs, and keeps proper records, he can pass on to the consumer all costs including taxes. But how many of the smaller business men recognize the heavy burden of taxes now being laid on business?

1936 Development in Metal Buildings

DURING 1936, appreciable progress has been made toward securing wider public acceptance of the all-metal or semi-metal building. The progress made during the year has not been spectacular—metal houses are not on everyone's tongue—but it probably is safe to assert that in many communities the prospective builder has the all-metal or semi-metal or fabricated house well up on the list of possible types to consider.

A considerable amount of the publicity attained during the year has been due to efforts of real estate developers and speculative house builders to provide a house within the price ranges below \$5,000 exclusive of the lot. The developer has, with the aid of architects, fabricators and designers in metal, worked out house types which carry the total cost down into the \$2,000 bracket of cost.

Architects must also receive generous credit for they have taken low cost housing seriously and begun experimentation with the type of house costing less than \$5,000 complete except for furnishings. This price ceiling has meant that every possible hour of expensive hand labor has had to be eliminated and where possible prefabricated or shop assembled sections used rather than bricks or boards. Machine production in shops, always one of the advantages of the pre-fabricated metal house, has met these requirements with great success.

Probably the most interesting development of 1936 is the Purdue University Housing Research Project in Lafayette, Indiana. Five houses were completed in the first six months of 1936. The research campus consists of 143 acres of land donated by David Ross, President of the Board of Trustees of Purdue University. The cost was set at not to exceed \$5,000 and a different type of construction and plan was used for each house.

In the group of details of design accompanying this article Group 1 shows Purdue's house Number 2 designed to develop a flexible system of construction that will permit houses of any plan to be largely prefabricated in the shop and erected with

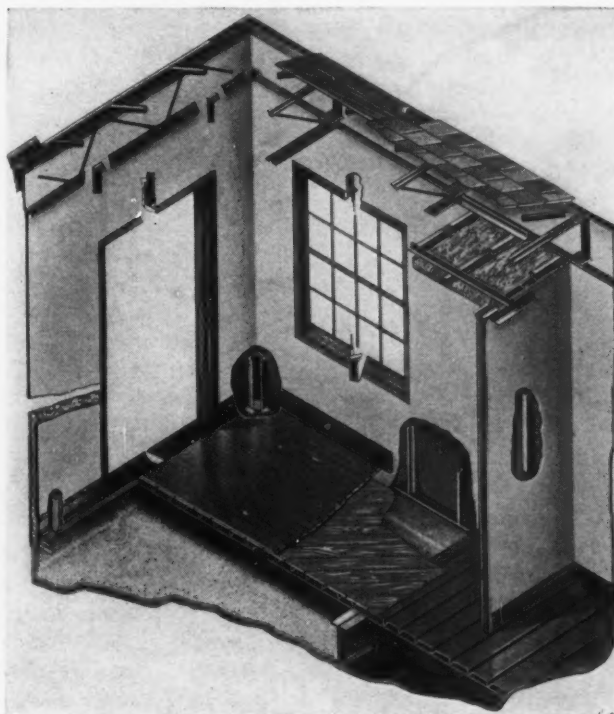
a minimum of field labor. The type of house was developed by General Houses, Inc., 620 N. Michigan Ave., Chicago. The cost of house Number 2 was \$4,625. The house has no basement and is built upon concrete piers tied together with a reinforced sill beam. A concrete slab floor is used over a tamped cinder fill.

The structural members of the house consist of prefabricated pressed steel studs bolted to the foundation on about 3 foot 2 inch centers. The studs are hollow to admit electric cable. Cover plates which are snapped and bolted into place close the openings in the vertical faces. A narrow strip of flexible insulation is placed over the outside of the exterior wall studs before the outside steel cover plate or batten is set in final position. Wall and interior partition studs extend about one inch beyond the finished inside wall surface making vertical panels about 3 feet by 7 feet.

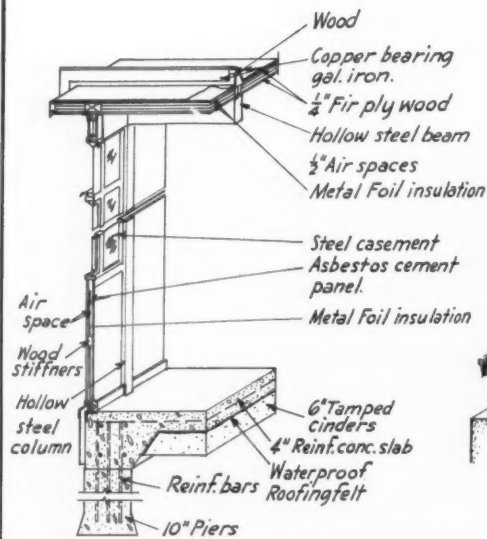
The outside cover plates are approximately flush with the outside of the studs. These cover plates are one inch thick and are wedged between the studs and held in place with steel batten strips. The panels consist of $\frac{3}{4}$ -inch thick wood frames to which is applied $\frac{1}{4}$ -inch thick asbestos cement board on the outside and $\frac{1}{4}$ -inch fir plywood on the inside. A sheet of building paper covered on both sides with aluminum foil is placed midway between exterior and interior walls. All panels are set in mastic.

The roof consists of assembled pressed steel channel shaped sections fabricated in the shop to $3\frac{7}{8}$ by $7\frac{1}{4}$ inches. These beams run from stud top to stud top. Prefabricated roof panels between these beams consist of $1\frac{5}{8}$ -inch wood frames with sheets of $\frac{1}{4}$ -inch fir plywood glued to the top and bottom. The $1\frac{5}{8}$ -inch space within each panel is divided into three air spaces by two sheets of paper covered on both sides with aluminum foil.

Joints formed by roof panels were covered with $1\frac{3}{4}$ by $3\frac{3}{4}$ -inch wood battens laid vertically to form horizontal ribs across the roof. Galvanized iron sheets with the long edges and one end bent upward 2 inches and of correct width are



Cut away details of the Harnischfeger metal and welded house. Steel framing, building board, metal floors, air conditioning are features.



WALL AND FLOOR SECTION

Fig. - 1

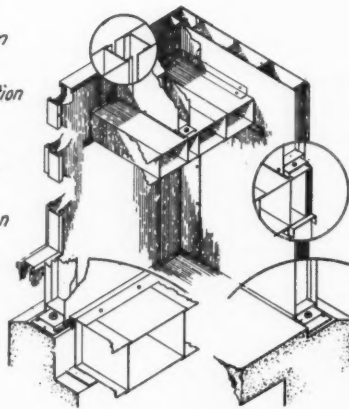
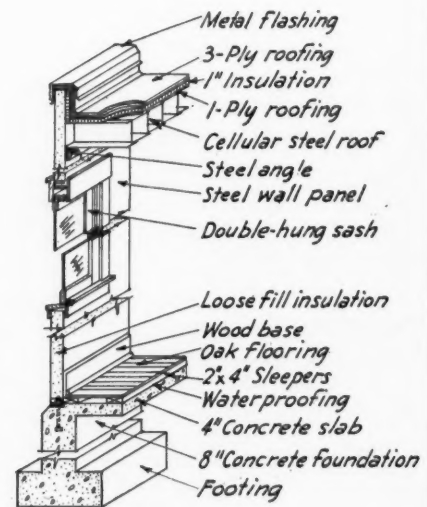


Fig. - 2A



WALL AND FLOOR SECTION

Fig. - 2

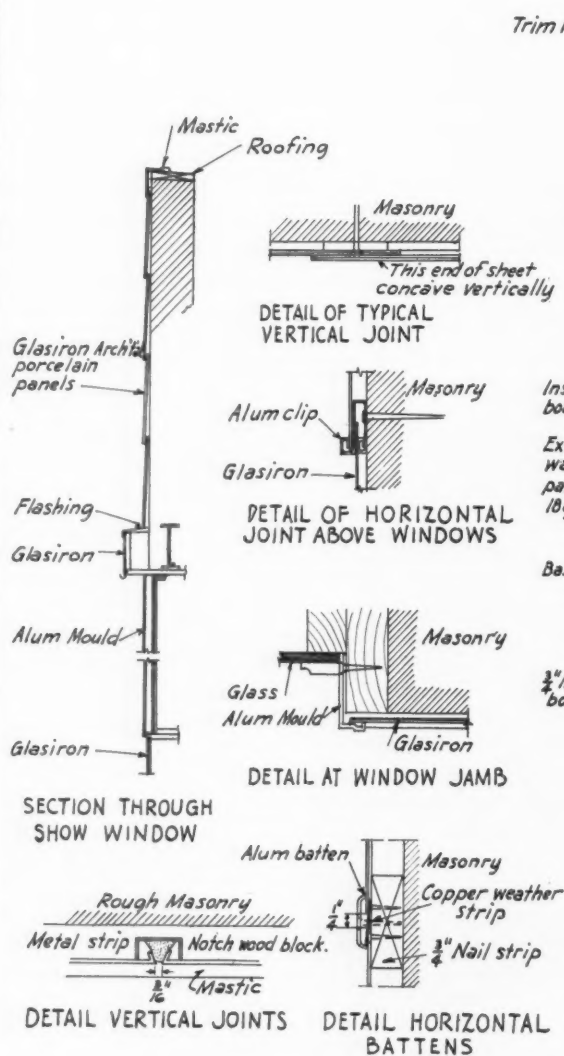
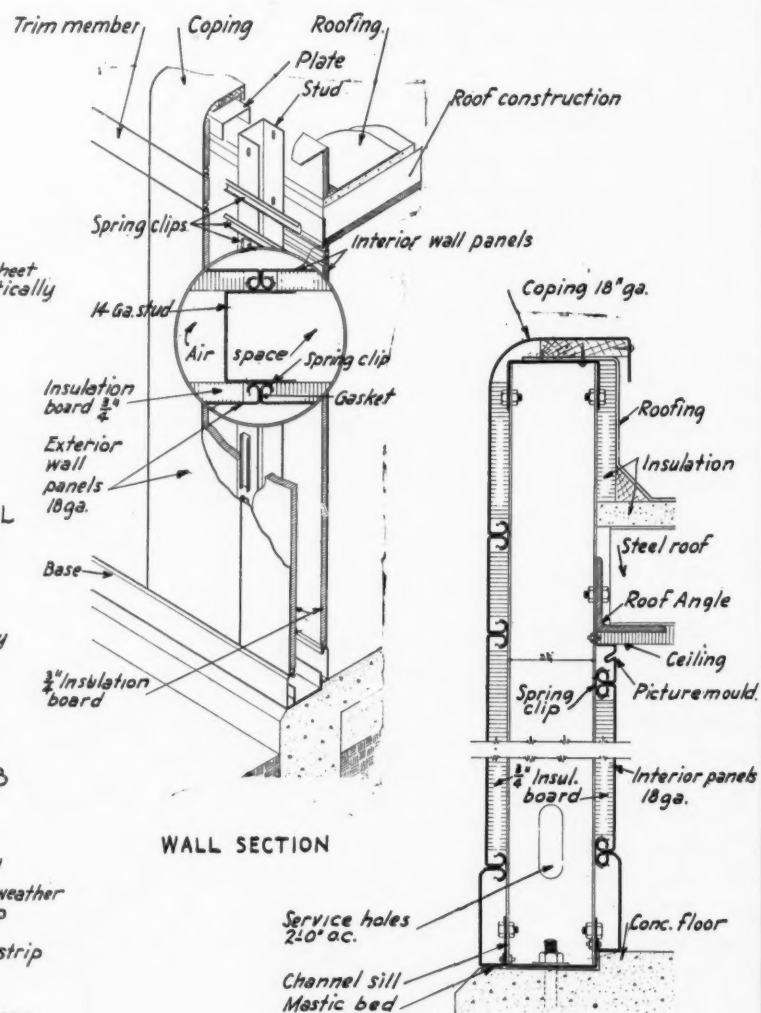


Fig. - 3

WALL SECTION
Fig. - 4

placed over the panels in a batten type roof construction. A U-shaped batten cap of galvanized iron is used. The roof is flat.

Purdue All-Steel House

An all steel house in which both exterior and interior walls are steel was erected as house Number 4 in the Purdue group. The design was originated by Insulated Steel Construction Co., Middletown, Ohio. The walls and roof are largely prefabricated and the total cost was \$4,992. Actual construction required 75 days.

This house has no basement, has a continuous foundation and a concrete first floor laid over cinder fill. The wall construction consists of steel panels 3 inches thick of varying width and full height from foundation to coping. The panels are made of light gauge pressed steel channel structural sections covered with 20 gauge steel sheets welded to either side of the structural members. Panels were fabricated in a shop and delivered to the site ready for erection using hand labor. The variation in size of panels and the use of connecting angles at corners made possible the use of this construction for any floor plan.

To locate panels correctly a steel sill is first embedded in the concrete. The edges of the panels are so formed that panels can be fastened together with self tapping screws. Since the panels are capped top and bottom and closed at the sides loose fill insulation is placed in the panels at the factory.

The roof consists of "Z" shaped sections of 20-gauge steel sheets spot welded together at the factory to form panels 2 feet wide and as long as necessary. The webs have a depth of 6 inches and are spaced 8 inches center to center. Rigid insulation boards one inch thick were laid with staggered joints over the roof and up the parapet in hot asphalt over 15 pound felt. Two layers of 15-pound felt and a final layer of 75 pound gravel-surfaced felt completed the roof. Coping flashing consisted of crimped 26-gauge galvanized iron (coping cap and cap flashing) and galvanized iron was used for the gutters.

Metal Siding House

A type of exterior in which the horizontal lines are emphasized is shown in the details of group 3. The plan was developed by the Glasiron Division of Wolverine Porcelain Enameling Co., Detroit, Mich. In this construction the enameled sheets are lapped horizontally with a special clip which holds the top of the lower course and the bottom of the upper course by tension of the spring. The clip is nailed into the framing or backing of the wall. In this construction vertical joints at ends of sheets are made by lapping the ends with the under sheet held to the backing by a countersunk nail or screw. Where necessary the joint can be soldered.

Where a wider horizontal band is desired for emphasis the lower and upper course sheets can be held apart slightly and a batten cap applied. In this application the edges of the course sheets are fastened to the backing with nails or screws while the batten is held by a counter sunk screw or nail. A narrow weather strip

is recommended—being placed behind the upper sheet and on the outside of the lower sheet.

Special moldings are used for corners, window frames, doors or any point where there is a sharp bend.

Horizontal Metal Panel House

One of the interesting developments of the year is the method of application shown in the details for group 4. This particular construction was planned for special metal studding, but can be used on any wall to which the necessary horizontal and vertical clips can be fastened. The method was developed and patented by Small Buildings Corporation of Chicago.

The details show how these special spring clips are formed as a tension grip in lengths which are cut to fit the space of the wall. The panels are formed with a 90-degree flange on all four sides welded at the corners and carrying a 1/2-inch bead formed on the inner side of the flange. The beads of adjoining panels snap into the spring steel channel clip. A cork or impregnated felt gasket is placed between the surfaces to give a cushion and make the joint water tight. Filling the spring channel with mastic or mineral jelly forms an air and water tight joint.

In the structures erected the special steel studs shown in the detail were bolted into a steel channel section which, in turn, is bolted to the foundation footings. A similar cap of lighter gauge joins the studs across their top to make a rigid frame. Studs are placed to take the door and window frames.

The exterior and interior walls are made of 18-gauge steel sheets backed with 3/4-inch insulating board to provide insulation and sound deadening. The walls so formed have been 5 inches thick which, deducting the insulating board, gives a 3-inch dead air space. The sheets used for exterior and interior are enameled. The movement within the clips makes it possible for the enameled sheets to expand and contract without fracturing the enamel, retaining the weather-tightness during all seasons.

Prefabricated, Welded House

As some indication of trends in this prefabricated building field we show a cut-away view of a welded house being manufactured and sold by the Harnischfeger Corp., Milwaukee.

This house was designed to cost less than \$4,000 in the six room size. There is no basement and the roof may be flat or pitched. Heating equipment, consisting of winter warm air, air conditioning, is placed in a heater room. The framework is formed of special steel sections bolted or welded together as shown. The exterior wall consists of a weather and fire resistant building board which insulates as well as protects. Between the outside and inside panels fill insulation can be added for further insulation.

The floor consists of panels formed of five framed sections made with 12-inch electrically welded steel channels doweled together. Each frame section is reinforced with five 6-inch cross channels. The underside of the base is completely covered with galvanized iron sheets covered with at least one inch of insulation. The house may be had with a basement.

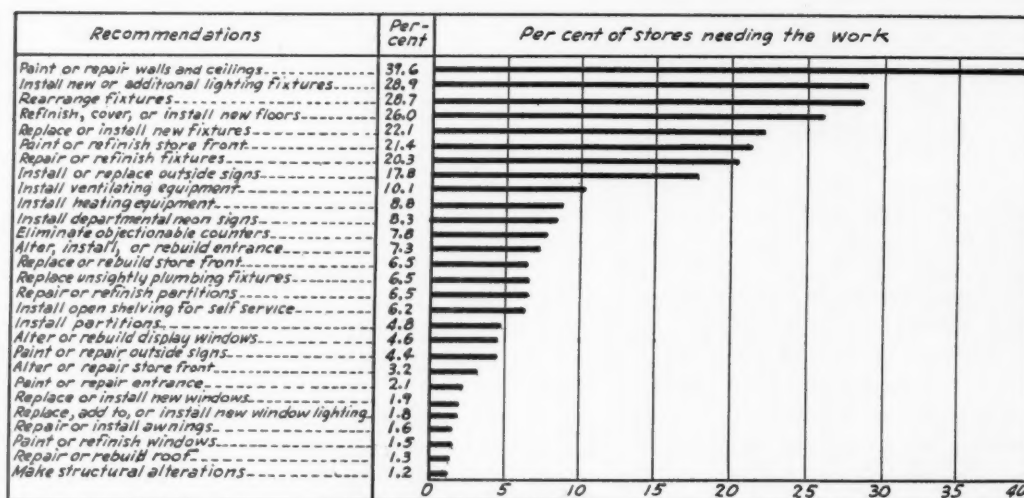


Fig. 1—Needs of stores arranged according to greatest needed improvement.

Store Modernization Should Be An Active Field in 1937

IN the encouraging reports covering the general rise in building construction much has been said about heavy construction, new factory and commercial buildings, home remodeling and new construction—even roads and streets and public works—but little has been mentioned so far about remodeling and modernization of store interiors and exteriors.

Despite this lack of publicity, store remodeling and modernization is right now a most attractive field for many contractors in the industry. The lack of profit and income which has curtailed other types of construction has influenced in exactly the same manner

the modernization of stores. Store keepers have been hard up for working capital. Business uncertainty has made owners hesitate. Every dollar made has been saved for future rainy days.

The result—as in other activities—has been the damming up of vast needs; interiors have been permitted to deteriorate; planned and needed repair or modernization has been postponed. Exteriors, in a similar manner, have slowly gone from bad to worse. Business men having their own buildings have let to contract only the bare necessities. Owners of tenant leased stores have approved as few expenditures as possible.

Kind of Business	Exterior Appearance (Per cent)			Interior Appearance (Per cent)		
	Good	Fair	Poor	Good	Fair	Poor
Apparel Stores.....	65	28	7	60	33	7
Jewelry Stores.....	61	29	10	55	34	9
Automotive Group.....	57	31	12	53	35	12
Lumber, Building, and Hardware Group.....	56	35	9	54	36	10
Stationery, Book, and Office Supply Stores.....	55	36	9	54	36	10
Drug Stores.....	54	38	8	56	39	9
Food Stores, other than Grocery.....	51	35	14	55	32	13
General Mdse. Farmer's Supply and Country Genl. Stores.....	50	35	15	49	36	15
Furniture and Household Stores.....	49	33	18	48	40	12
Cigar Stores.....	48	32	20	52	33	15
Restaurants, Eating and Drinking Places.....	42	40	18	47	38	15
Barber and Beauty Shops.....	42	45	13	50	39	11
Grocery Stores, Meat Markets, and Delicatessens.....	41	43	16	45	41	14
Miscellaneous Retail and Second Hand Stores.....	35	34	31	34	37	29
Mechanical Repair and Service Shops.....	35	41	24	33	45	22
Dry Cleaning, Pressing, Shoe Repair Shops etc.....	28	49	23	28	47	25

Fig. 2—Types of businesses showing greatest need for improvement.

TABLE 3

Percentage of Observed Establishments in 23 Selected Cities Reporting Specific Modernization Needs, by Kinds of Business¹

Modernization Recommendations	1226 Grocery Stores	479 Other Food Stores	298 General Mide. Stores	694 Apparel Stores	944 Automobile Group	267 Furniture Group	460 Hardware & Bldg. Group	1128 Restaurants etc.	85 Cigar Stores	420 Drug Stores	143 Jewelry Stores	112 Stationary & Book Stores	327 Misc. Retail Stores	579 Barber and Beauty Shops	592 Cleaning and Pressing	354 Mechanical Service
EXTERIOR																
No recommendation	49.8	54.1	47.3	57.8	67.2	44.8	53.0	53.6	64.7	51.7	59.0	63.4	43.4	54.6	44.6	51.4
<i>Store front</i>																
Paint or refinish.....	24.6	19.8	21.1	15.6	16.2	19.4	17.6	26.3	12.9	18.6	13.9	12.5	28.3	21.8	27.5	23.7
Replace or rebuild.....	6.3	8.8	8.1	3.3	3.9	6.7	5.7	7.5	8.2	6.2	4.9	5.4	10.8	5.5	10.5	6.2
Alter or repair.....	4.6	3.3	4.4	1.9	1.9	2.2	4.6	2.6	4.7	2.9	0.7	1.8	4.3	3.1	3.4	4.5
<i>Outside signs</i>																
Install or replace.....	21.5	18.4	16.8	22.0	13.7	20.5	22.2	12.9	9.4	13.1	15.3	22.3	19.7	19.2	15.4	22.6
Paint or repair.....	4.6	2.7	3.4	3.7	3.0	6.7	4.8	4.6	..	7.6	4.9	0.9	4.6	5.4	5.6	4.2
<i>Entrance</i>																
Alter, install or rebuild.....	9.4	6.1	6.0	5.5	5.8	4.9	7.4	8.7	1.2	8.1	7.6	6.2	7.7	6.6	9.8	5.4
Paint or repair.....	2.6	3.3	1.3	1.3	1.9	3.0	2.2	2.4	..	1.2	2.1	..	0.9	1.9	2.0	4.0
<i>Windows</i>																
Alter or rebuild.....	7.5	3.8	6.0	5.2	0.7	9.0	5.4	3.1	2.4	6.4	16.7	1.8	4.0	2.4	3.4	4.5
Replace or install new.....	2.9	1.5	3.7	1.6	0.2	1.1	1.7	1.2	2.4	3.3	3.5	0.9	2.2	1.6	2.4	1.7
Replace, add to or install new lighting.....	1.3	2.7	4.7	2.7	0.3	3.7	2.2	1.0	1.2	1.7	3.5	4.5	3.7	1.0	1.5	2.0
Paint or refinish.....	1.0	1.3	4.0	1.6	1.3	2.6	1.7	0.9	..	2.4	1.4	..	2.8	1.6	0.7	1.7
Awnings, repair or install.....	1.1	0.4	1.3	2.7	0.3	1.5	1.7	1.6	1.2	3.3	2.8	3.6	3.1	2.1	1.2	1.4
Roof, repair or rebuild.....	1.9	1.0	0.7	1.0	1.3	..	0.7	1.2	..	1.0	0.7	0.9	1.5	1.6	2.2	1.1
Rebuild entire exterior.....	0.5	0.6	1.0	0.3	0.5	0.4	0.9	0.2	1.2	..	0.7	..	2.2	0.7	0.8	3.7
INTERIOR																
No recommendation	31.5	45.5	31.9	43.4	46.8	38.4	38.3	35.4	42.4	36.7	31.2	42.9	27.4	40.6	25.7	31.1
Walls and ceilings, paint or repair	45.2	35.7	35.9	25.6	35.5	38.8	33.5	41.8	40.0	31.4	41.0	33.9	48.3	35.9	54.4	51.7
Lighting fixtures, install new or additional	34.7	22.1	33.9	21.2	23.3	29.5	27.2	26.9	22.4	23.8	27.1	26.8	40.6	22.5	33.8	32.5
Fixtures (shelves, cases, etc.)																
Rearrange.....	41.3	22.3	35.1	26.0	20.5	30.5	28.6	21.8	37.5	30.5	14.7	20.0	33.3	11.7	25.3	32.4
Replace or install new.....	31.4	20.7	27.9	20.5	15.8	15.7	20.0	22.7	17.6	24.0	21.5	25.9	28.9	18.7	29.9	20.6
Repair or refinish.....	26.3	15.2	19.5	14.3	16.7	15.7	18.7	22.4	14.1	19.0	15.3	20.5	23.7	16.2	27.9	22.9
Eliminate objectionable counters.....	17.7	4.8	13.8	11.0	1.9	1.5	9.6	3.0	3.5	16.0	6.9	13.4	9.5	0.7	5.9	3.7
Install open shelving for self service	14.4	3.3	8.7	1.9	7.6	3.4	5.4	5.0	3.5	4.5	3.5	2.7	4.0	1.4	6.1	6.5
Floors, refinish, cover or install new.....	33.0	18.0	26.5	19.6	20.0	23.1	24.3	25.5	17.6	18.1	20.8	24.1	29.5	19.9	33.8	55.6
Ventilating equipment, install.....	10.3	9.2	13.1	11.1	5.6	8.2	9.8	13.7	11.8	6.2	12.5	8.9	9.8	10.0	11.8	10.7
Heating plant, install.....	12.6	5.8	10.7	6.9	7.5	11.2	9.6	7.1	8.2	8.3	9.0	11.6	11.4	7.6	9.6	6.5
Departmental neon signs, install.....	8.9	4.1	13.8	7.2	8.2	13.4	9.1	6.4	..	12.2	8.8	10.0	10.2	6.2	4.9	9.5
Plumbing fixtures, replace unsightly.....	6.2	5.2	7.7	5.6	6.0	6.3	5.2	8.3	2.4	5.0	6.2	5.4	5.0	7.3	10.0	5.6
<i>Partitions</i>																
Repair or refinish.....	8.3	6.3	6.7	1.6	3.9	5.2	6.7	8.1	7.1	4.5	3.5	7.1	8.3	6.2	9.8	9.3
Install	5.5	4.2	5.0	1.7	2.3	8.2	3.9	4.0	..	6.0	6.2	5.4	3.4	5.7	11.7	7.9
<i>Structural changes</i>																
Alterations	1.0	1.5	1.0	1.6	0.6	1.9	0.9	0.8	2.4	2.1	0.7	..	1.8	0.7	1.7	2.0
Additions	0.2	0.2	1.0	0.1	0.8	0.4	0.2	0.3	..	..	..	..	..	0.2	0.2	..
Rebuild entire interior.....	0.6	0.4	0.7	0.1	0.5	0.4	0.7	0.4	..	..	0.7	..	0.3	0.5	0.3	1.1

¹For number of stores reporting recommendations, upon which percentages are based, see separate table for each kind of business. This series of tables starts with Table 14C.²Observations in 2607 stores in 15 cities.

So we come, in this year of 1937, to a situation where business income is going up; profits are increasing; competition is growing keener; buyers are giving more and more preference to the brightly lighted, clean, attractive store—and something has to be done by the store keeper.

So far as our particular field is concerned our industry will get business from store modernization and remodeling from the following classes of work:

1. New heating systems.
2. Air conditioning.
3. Ventilation.
4. New interiors (mostly new ceilings).
5. New exteriors using bright metal.

New heating, air conditioning and ventilating systems probably need little explanation. Most contractors know pretty well the needs of store owners in their operating area, but new interiors and exteriors are often overlooked. That interiors and exteriors should be one of the chief sources of prospective business is thoroughly indicated by the Study of Store Modernization Needs published as Market Research Series Number 8 by the Department of Commerce, Department of Foreign and Domestic Commerce.

The first analysis of interest is Fig. 1 which shows the needs of the stores surveyed according to which need was apparent in the largest number of instances. Looking at the tabulation we are immediately impressed by the enormous percentage of stores requiring paint or repair of ceilings and walls. Practically 40 per cent of all stores need work of this type. If we deduct one-half to cover those stores where paint alone is sufficient, we still have left 20 per cent of all stores needing ceiling repair. Further interesting figures on this finding are seen in Table 3, above.

For ceiling repair in stores there is nothing quite so good as metal ceilings.

The report states—"There are more stores needing interior modernization than exterior modernization.

"Nearly 40 per cent should have the walls and ceilings painted or repaired.

"Fortunately, the needs most frequently reported are improvements that call for a comparatively small outlay of money, but which are important from a merchandising point of view. The most frequent recommendation for interior needs appear to be for the painting and repairing of walls and ceilings and for the improvement of store lighting."

Metal ceilings and side walls mean elimination of repair, and insures fire resistance, better light reflection, pleasing, bright appearance and cleanliness.

The next need shown in Fig. 1 is for ventilation (10.1 per cent of stores need); better heating equipment (8.8 per cent of stores need); replacement or rebuilding of store front (6.5 per cent of the stores need) indicate still further service our industry can supply. Little has to be said about this market. Most contractors have handled more or less of this type of work—the interesting thing is that so many stores out of every hundred need improvements of these kinds.

Businesses Most Needing Work

Fig. 2 is of interest to the contractor devising a campaign to develop work in this field. Fig. 2 shows types of businesses most needing the various improvements shown in Fig. 1. The value of Fig. 2 is established when a campaign is being worked out since Fig. 2 shows that in any given community certain businesses (say dry cleaning, or grocery or restaurants) show fewer good, clean, attractive interiors and exteriors than do apparel or jewelry or drug stores. Any deliberate program would be developed accordingly.

An interesting fact developed by the survey was that even among stores located in "dense traffic" or, in other words, larger stores on busy streets, only 46 to 48 per cent of all stores surveyed showed "good" exterior facilities. Some 49 per cent of the exteriors showed as "fair" or "poor." To quote the survey—

"When it is realized that retail stores in heavy traffic areas depend largely on their store fronts and windows to convert passing traffic into customers, the poor showing takes on added significance. It is recognized that the need for excellent appearance is less urgent for stores in low traffic areas, but even these can benefit by improved appearance. It is difficult to imagine good appearance as a harmful influence. When it is realized that both the exteriors and interiors of approximately 80 per cent of stores in low traffic areas present a 'fair' or 'poor' impression, the need for modernization is strongly suggested."

Air Conditioning

With respect to the value of air conditioning in retail stores the survey states: "The value of air conditioning to a retail establishment is fully conceded. It appears to be a worth while promotional device. On every hand restaurants with air conditioning may be found crowded to capacity during hot weather, while competitors without such equipment suffer loss of trade. It appears that air conditioning is a valuable asset to a business, especially for those establishments in which customers spend some time, such as restaurants, department stores, drug stores with food counters, barber and beauty shops. On the other hand, the store that supplies the average customer with one or two items which are quickly purchased is not a likely prospect for air conditioning at the present time."

3,500 Sq. Ft. of Dead Level Roof

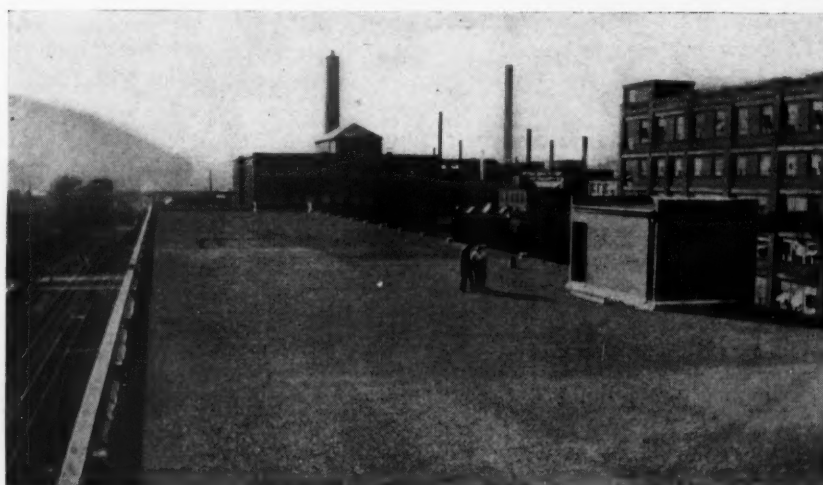
THE 3,500 square feet of built-up roof recently applied to the new three-story warehouse of the Corning Glass Works, Corning, N. Y., is viewed with justifiable pride by the contractor—the Binghamton Slag Roofing Company, Binghamton, N. Y.—because of the fact that 22 figures were received and the contract awarded upon reputation for doing high grade work rather than price.

Says J. Boyd Griffiths, assistant general manager: "We applied a slag roof over the entire roof area, one-half of the roof showing in the photograph, and installed all the sheet metal work. The steel columns were carried above the roof deck, as shown, and these column stubs were flashed and covered by us.

"This is a dead level roof. The built-up roof is laid over a wood

deck and consists of a four-ply slag construction with a dry sheet of red rosin sized sheathing paper. There is no insulation used. The roofing was flashed up the inside face of the parapet wall to the underneath

face of the coping, where a metal through-wall flashing is carried across the top of the wall under the coping and bent down to form a counter flashing over the base flashing."





VOT



EVOT

RESIDENTIAL AIR CONDITIONING SECTION

ENCOURAGING, indeed, is the rapidly widening appreciation that true human comfort is the aim and purpose of all residential air conditioning and that engineering design, shop fabrication, field erection—even selection of apparatus—are only means to that end.

. . . We have, so far, given far more attention to these “means to an end” than we have to actual comfort. Today, however, we are changing our thinking and rapid strides toward greater customer satisfaction are to be anticipated. A timely article in this connection will be found on page 99.

. . . During 1937 ways and means of selling this great birthright of ours—air conditioning—will demand more and more attention. Accepted merchandising policies gleaned from dozens of successful records, will be presented in the form of a merchandising manual, the first part appearing on page 103.

IT PAYS TO GET THE BEST

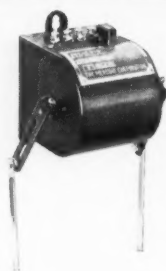


GENERAL OFFICE AND FACTORY AT CHICAGO, ILLINOIS



MERCOID SENSATHERM

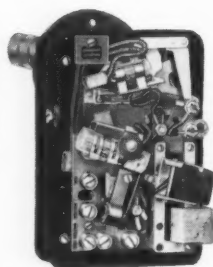
The thermostat of beauty and mechanical perfection. Maintains an even room temperature without the aid of any artificial acceleration. Several types available for various applications.



DEPENDABLE DAMPER
CONTROL, FURNISHED
COMPLETE WITH
ALL ACCESSORIES



THE STANDARD FAN
AND BLOWER CON-
TROL IN THE WARM
AIR HEATING FIELD



A POSITIVE OIL BUR-
NER SAFETY CON-
TROL. VARIOUS
TYPES AVAILABLE



TYPE M-51 LIMIT CON-
TROL TO PROTECT
WARM AIR FURNACES
FROM OVERHEATING



STOKER CONTROLS
OF PROVEN MERITS.
UNUSUAL IN OPERA-
TION AND DESIGN

MERCOID CATALOG WILL GIVE YOU COMPLETE DETAILS
THE MERCOID CORPORATION • 4201 BELMONT AVE. • CHICAGO, ILL.
Gentlemen: Please send Catalog No. 100-T
NAME _____
ADDRESS _____

MERCOID CONTROLS ARE BUILT TO ENDURE

Years of experience, skill, material and scientific research are combined in Mercoid Controls. That is why they are dependable under all operating conditions. To insure complete satisfaction, always specify Mercoid Controls.

**MERCOID
SWITCHES**



**ELIMINATE
ALL CONTACT
TROUBLES**



SELL WINTER AIR CONDITIONING
first
THEN YOUR FURNACE WILL SELL ITSELF

● Prospective buyers are more interested in what a modern heating unit will do *for* them, than in how it is built. So, in all your sales talks, emphasize the importance of *clean* warm air to health, comfort and general wellbeing. Stress the saving that results from protecting walls, carpets, draperies from the ravages of dust. Talk *winter air conditioning*—not merely heating. Show them how Dust-Stop Air Filters stop dust, lint, pollen and dust-carried bacteria.

Dust-Stop Filters are now being advertised nationally. Soon millions will know of their high efficiency and the fact that they are fireproof. So talk up Dust-Stop, the air filter that is now standard equipment on the outstanding warm-air units. And to make extra money on filter replacements, stock up on Dust-Stop Filters. Your manufacturer will supply you. Use coupon for additional information on selling winter air conditioning.

OWENS-ILLINOIS GLASS COMPANY, TOLEDO, OHIO

DUSTSTOP
REPLACEMENT TYPE
AIR FILTERS

COUPON

OWENS-ILLINOIS GLASS COMPANY
Industrial and Structural Products Division
301 Madison Avenue, Toledo, Ohio.

Gentlemen: Please send, without obligation, full information about the importance of Dust-Stop Air Filters in winter air conditioning.

Name _____

Address _____

City _____

State _____



• New sales ideas—
new advertising—unus-
ual dealer plan.

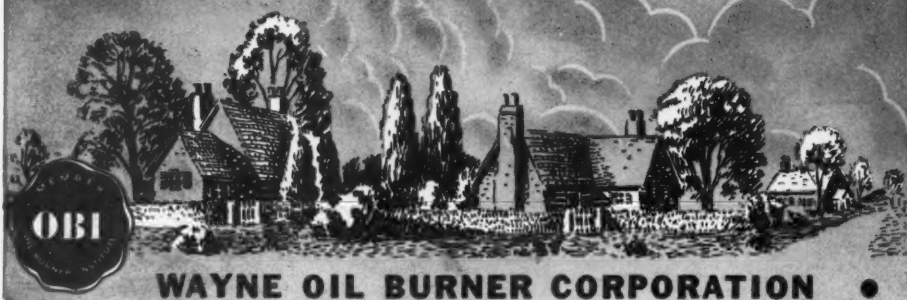
• New refinements in
engineering and con-
struction.

• Eye appeal—rugged
design—proven opera-
ting economy.

WAYNE

WEATHER SELECTOR

IT'S easier to build up your sales and profit with the Wayne line of Weather Selectors—the "Mistoll" Burner, the Wayne Boiler-Burner Unit and the Wayne Air Conditioning System. They're widely advertised. They have a reputation gained through years of satisfying performance. Tie up with the leaders and quit trying to buck public resistance to untried devices. The name "Wayne" has been favorably known in the petroleum industry for almost half a century. You make more profit with less investment, too, because you have only one size to carry in stock—a universal size with capacity for any domestic installation. Write today for dealer plan.



WAYNE OIL BURNER CORPORATION



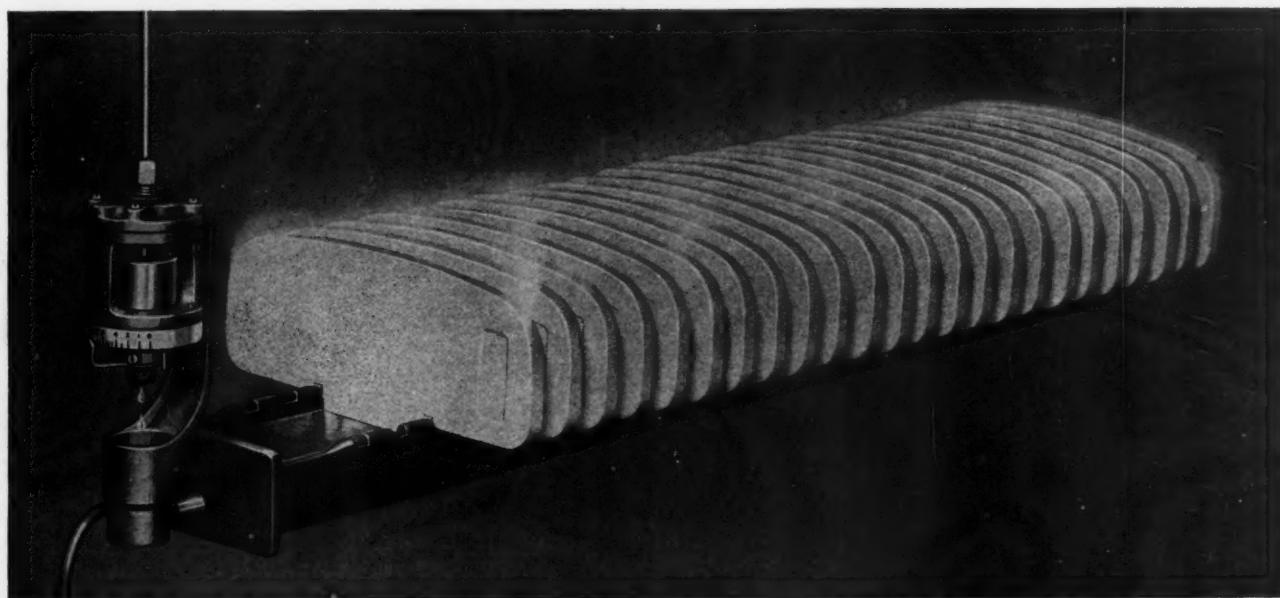
• FT. WAYNE, INDIANA

AUTOMATIC

The Hydro-Metric Humidifying

**JUNE**

System



Sets a NEW HIGH Standard in HUMIDIFICATION

With Automatic June, you can specify and attain winter indoor humidification scientifically, correctly and accurately . . . It modulates humidification in accordance with outdoor temperatures . . . produces adequate humidification in extremely cold weather without the penalty of excessive window condensation. It eliminates "weeping windows."

Other outstanding advantages are . . . It provides ample evaporation in mild weather, when bonnet temperatures are low . . . It provides ample evaporation in forced air systems . . . Extremely small area of evaporator does not impede air flow inside heating chamber . . . Will not clog—water is filtered . . . Liming is eliminated . . . Easily installed in any air conditioning or warm air heating unit.

Automatic June is revolutionary, unique, an essential element in any modern air conditioning system. Write for particulars.

MONMOUTH PRODUCTS CO.

231 E. 131st Street

Cleveland, Ohio

BASEMENT CONTROL UNIT

This newer model, illustrated above, is a complete, self-contained unit. The humidity control device is mounted on the end of the evaporator projecting outside the casing. This model is popular priced but includes every element which makes Automatic June the perfected humidifying system.

ROOM CONTROL UNIT

Includes a handsome bakelite control instrument, the "Humitor" which mounted in any living room, gives added convenience. The home owner can see the water dripping on its way to the evaporator. Dial shows rate of evaporation per day in gallons. The ultimate in convenience and efficiency.



SEND FOR FREE BOOK

"The Science of Re-Humidifying Indoor Air," graphically illustrated, tells clearly and simply how to meet modern humidification requirements. You need it in your business. Send for your copy today.

MONMOUTH PRODUCTS CO.
231 E. 131st St., Cleveland, Ohio
Please send me book "The Science of Re-Humidifying Indoor Air" and literature describing Automatic June.

Name

Business

Address

City State

Automatic Controls

COMPLETE PACKAGE OUTFITS

Containing Systems of Control for the Warm Air Field

THREE ELECTRIC JANITOR PACK-
AGES FOR HAND FIRED SYSTEMS

ONE GAS FIRED GRAVITY WARM
AIR PACKAGE

ONE GAS CONTROL PACKAGE

ONE OIL OR GAS FIRED FORCED
WARM AIR PACKAGE

EIGHT COAL FIRED FORCED
WARM AIR PACKAGES

THREE GAS FIRED FORCED
WARM AIR PACKAGES

ONE ATTIC FAN VENTILATION PACKAGE

"Dependable Controls
Cost Less than Service"



MINNEAPOLIS

CONTROL

BROWN INDUSTRIAL INSTRUMENTS FOR

H
SYS
INI

for Every Purpose

REGARDLESS of the size or type of automatic heating, ventilating or air conditioning system you install, there is a Minneapolis-Honeywell automatic control system for it. Each control system is selected to meet exactly the individual requirements of the installation. Be sure you include complete automatic Minneapolis-Honeywell controls on every job. They

are your assurance that the system will function at its best, with the greatest efficiency, economy and trouble free performance. The Minneapolis-Honeywell Engineer in or near your city is available for consultation at all times. Minneapolis-Honeywell Regulator Co., 2726 4th Ave. So., Minneapolis. Branch and distributing offices in principal cities.

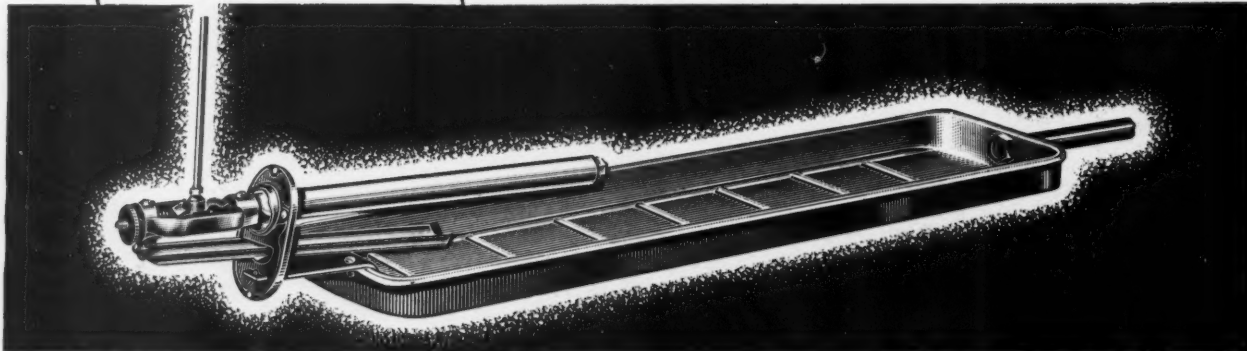
HONEYWELL

SYSTEMS

INDICATING, RECORDING AND CONTROLLING

THERMO=DRIP HUMIDIFIERS

Fully Automatic



Thermo-Drip No. 21S is shown here with No. 6 thermostat. Note that larger, more shallow water pan!

*because they are
Heat Controlled*



● If you are accustomed to think of humidifiers as devices that merely provide the means to moisten indoor air and that one device will perform this function as well as another — look at THERMO-DRIP! Your own eyes will tell you this humidifier is entirely different . . . it's *completely* automatic. It offers the *plus* feature of controlling the AMOUNT of moisture — the most vital factor in re-humidification. ● This automatic operation of THERMO-DRIP is the result of a basically different method of feeding water to the pan. There is no constant volume of water in the pan. No mechanical operation of the valve. No complex instrument or regulator. No electrical control. The sensitive thermostat projecting over the pan does all the work. It opens a water valve on the outside of the furnace as the bonnet temperature rises . . . throttles the water flow to the pan as temperatures recede . . . shuts off the valve when furnace fires go out. ● This method takes the complication and guesswork out of humidity

.. the basically different operating method that wins customers and earns profits more easily for you

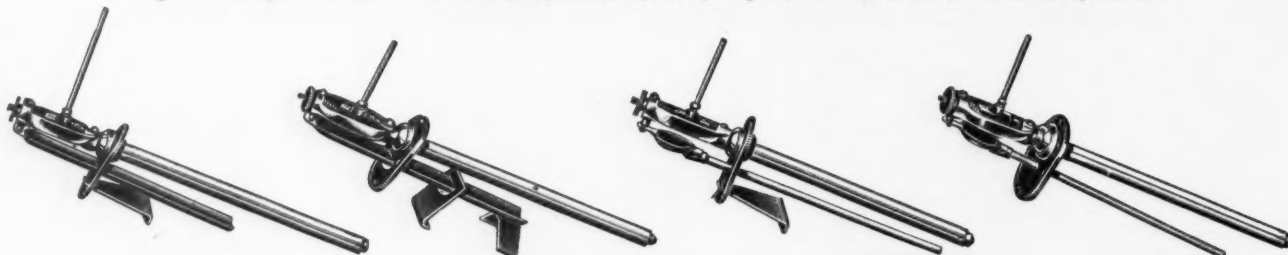
control — gives home owners the benefit of automatic humidity control with utmost simplicity — gives you the extra profit that always goes with selling people what they want. ● The economy of THERMO-DRIP installations also appeals to home owners. The first cost is low; they save the cost of auxiliary instruments; non-corrosive Monel metal valve and stainless steel pan assure a long period of service without replacements or repairs. And since the pan is dry when furnace is cold, there's no early deterioration of furnace pipes and parts. ● Give THERMO-DRIP the "once-over." It has increased amazingly in popularity every heating season . . . it must have something to offer that other humidifiers cannot match. Write for complete details today.

AUTOMATIC HUMIDIFIER CO.

18th and Main Streets

CEDAR FALLS, IOWA

The four thermostats illustrated here . . . together with five sizes of pans ranging in evaporating area up to 276 square inches . . . will fulfill practically every requirement of warm air re-humidification.



**THERMOSTAT
No. 6**

has a drip spout and slotted trim plate for hanger used on our stainless steel pan.

**THERMOSTAT
No. 8**

is furnished when humidifiers with cast iron pans are ordered. Otherwise same as No. 6.

**THERMOSTAT
No. 4**

has a drip cup with copper tubing; can be used with our stainless steel pan.

**THERMOSTAT
No. 2**

is ideal for use on furnaces with built-in evaporators. Otherwise similar to No. 4.

Avail
Top

Se

insu
com
that
are t

For
the
pany
hand
lead
prod
perm
regul
Gove

Th
when
buy F
ERS
home
on th
ance,
econo

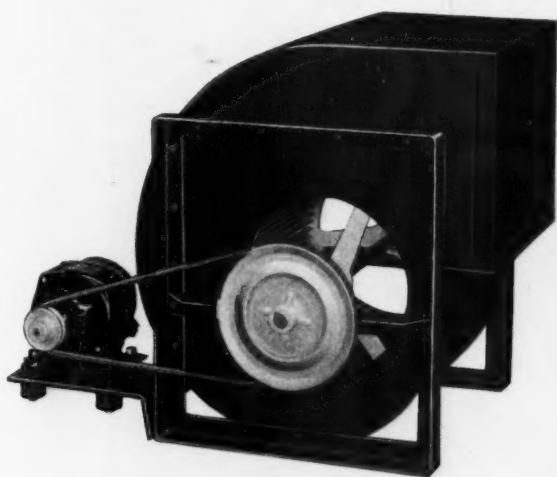
Yo
your p
your
thing

SC
LOC

From Now On IT'S HY-DUTY

Specify and Buy
HY-DUTY BLOWERS
They're NO.1 at any price

Available in Top Horizontal—Bottom Horizontal—
Top Vertical and Bottom Vertical Discharge Outlets



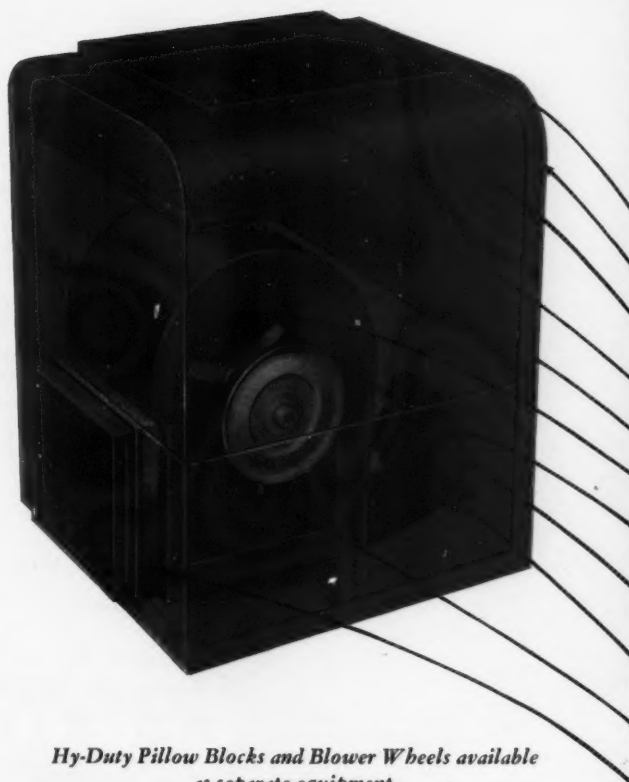
*"Manufactured by
Schwitzer-Cummins"*

insures that the engineering is competent and advanced and that workmanship and materials are the very best.

For more than eighteen years the Schwitzer-Cummins Company have been suppliers of air-handling equipment to over 350 leading builders of engineering products whose specifications permit only the best, and are regular suppliers to the U. S. Government.

This is your assurance that whenever you recommend or buy HY-DUTY CONDITIONERS to go into your customers' homes, you have put your O. K. on the best there is in performance, reliability and simple and economical operation.

You can not afford to risk your profits or the good will of your customer-friends on anything less.



*Hy-Duty Pillow Blocks and Blower Wheels available
as separate equipment.*

Write for prices and engineering information.

SUPERIOR FEATURES OF HY-DUTY BLOWERS

- UNUSUAL ECONOMY
Ample size—slow speed—efficient air delivery
- HY-DUTY MULTI-BLADE BLOWER WHEELS
Forward curved blades—statically and dynamically balanced
- HY-DUTY HOUSINGS
Heavy gauge steel throughout—welded seams
- SELF-ALIGNING, SELF-OILING HY-DUTY PILLOW BLOCKS
- HEAVY STEEL MOUNTING BRACKETS
For universal installation. Eliminate distortion and vibration

Superior AT EVERY POINT

- PERFORMANCE
- QUALITY
- ENGINEERING
- SELLING FEATURES
- PRICE

11 SUPERIOR FEATURES OF THE HY-DUTY BLOWER-FILTER UNIT

- Flanged Inlet.
- Modernistic Heavy Steel Cabinet.
- Large Access Door.
- 4 Filters.
- Perfect Filter Seal.
- 14" Diameter Hy-Duty Blower.
- Induction Motor with Automatic Overload Protection.
- Variable Speed Drive (Adjustable Over Entire Range on the Job).
- Full Floating Rubber Motor Mount.
- Split Cabinet Construction, for Easy Installation (All Screws Concealed).
- Sponge Rubber Outlet Blower Seal.

MANUFACTURED BY THE BLOWER DIVISION OF
SCHWITZER-CUMMINS COMPANY
LOCATED AT FAN STREET . . . INDIANAPOLIS, U.S.A.

CENTURY *will again make* NEWS *in 1937*



NEW CENTURY ZEPH-O-LATOR

The low-priced complete warm air furnace unit with winter air conditioning. New-Type 6 radiator unit furnace and many other outstanding new features. Write for details.

Keep watching Century in 1937. There'll be big news breaking. New models, new, exclusive features, new attractive merchandising helps to create an even bigger, more profitable business for Century dealers. This year, Century broke all previous records for sales with the complete line of Century oil-fired Floating Flame heating equipment. From coast to coast dealers report more sales with less service . . . a combination that produces profits. The Century franchise may still be available in your community. If you're anxious to go places in '37, write today for complete details of the Century money-making dealer offer, and Century equipment.

CENTURY ENGINEERING CORP.
CEDAR RAPIDS IOWA

CENTURY

Conversion Burners — Boiler-Burner Units
Warm Air Furnace Units with Air Conditioning —
Hot Water Heaters — Humidifiers

★ Type
8-Day
Mo

A MA
the ap
liabilit
Priced
moder
ver co
respon
damp
Listed
in eigh

W

MASTER

Whether you are a contractor, jobber, or engineering executive, you get the best and save the most with MASTER PRODUCTS. Sturdily constructed of finest materials—built by experts—backed by over twenty years of growing success in the heat regulator field. Master builds in accuracy and long life, and offers these instruments at the lowest possible price for which such quality and service can be purchased.

★ Type B-144 — Gradual Operation

For precision, performance and long-time dependability this is THE instrument in the entire field of automatic heat control. It has four-position smoothness together with the unequalled sensitiveness of Master's patented Thermo-Wafer. Contacts are platinum-iridium. Special non-inductive thermal starting switch requires less than 3 watts. The four-pole induction motor operates at 16 volts through a special low-reactance type of transformer. Listed as Standard by Underwriters' Laboratories.

★ Type B-144
8-Day Clock
Model

★ Type B-144
Plain Model

★ Type B-144
Motor

● Type B-22 Standard

A MASTER instrument with the appearance, accuracy and reliability characteristic of the entire line. Priced for the greatest market of all—moderate salaried home owners. Has fine silver contacts, and 1 degree temperature range response. Motor is quiet with ample power to lift any damper. Furnished with attached or separate transformer. Listed as Standard by Underwriters' Laboratories. Also furnished in eight-day clock model.

● Type B-22
1-Day Clock
Model

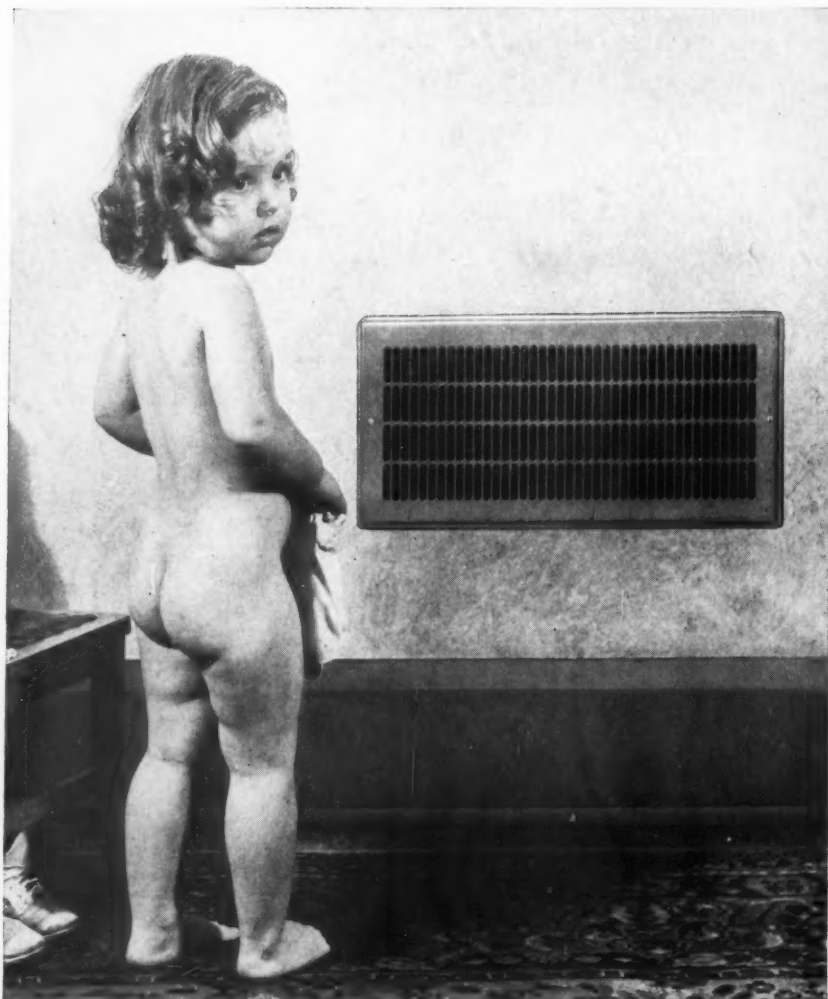
● Type B-22
Plain Model

● Type B-22
Motor

WHITE MANUFACTURING COMPANY

2362 UNIVERSITY AVE. ST. PAUL, MINN.

Dependability Built in by Master Craftsmen



Showing No. 2030 "Classic" Wall Register

"Register Satisfaction"

"IN this business of modelling," says the attractive sub-sub-deb in the picture, "we girls have to protect our health—with AUER Registers." And the comfortable heat from an AUER "Classic" keeps her as happy as if she were on the sands at Miami. So even the camera "registers satisfaction."

It's invariably that way—when AUER Registers are chosen for the *delivery end* of a warm air or air conditioning system. Heating men know that customers are *sure* to be pleased with the almost wear-proof construction, easy valve control, generous circulation area, and trim modern design of AUER Models. The record shows that more and more of the men who *get the business* make it a habit to recommend and install AUER Registers. Complete Catalog on request.

A Complete Line
of Registers
Cold Air Faces &
Grilles—A type, style
and finish for
every requirement

The Auer Register Company, 3608 Payne Ave., Cleveland, O.

AUER DISTINCTIVE **REGISTERS**
& GRILLES  **For Air Conditioning and Gravity**



COMPLETE YOUR 1937 JOBS with GUARANTEED COOK CONTROLS

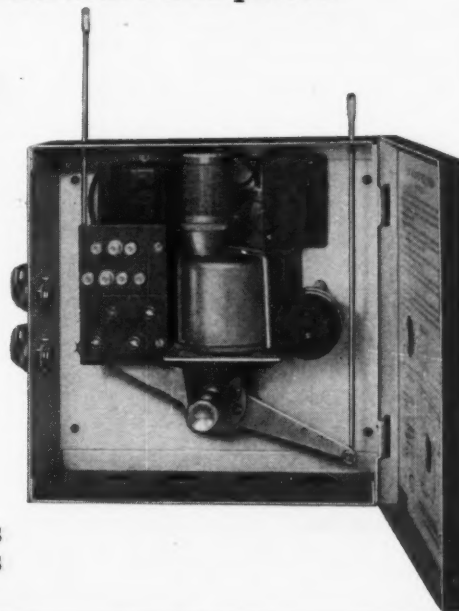
The success or failure of the forced air heating plants which you install in 1937 depends largely on the type and quality of control system you use to complete the job. And you know from past experience that the best method of insuring success on *all* of these jobs is to specify and install a COOK No. 218 system.

A COOK system is simple to install, easy to operate, and last but most important, service-free. Only three pieces . . . thermostat, control box and furnace switch connected by a coded cable to coded lock nuts. The reliability of the No. 218 has been proved from coast to coast by years of customer-satisfaction. Many leading furnace manufacturers use as standard and recommend the COOK No. 218 Control System.

Install a COOK system on your next job and you'll be convinced. Drop us a line for literature and prices.

COOK ELECTRIC COMPANY

2706 SOUTHPORT AVENUE
CHICAGO, ILLINOIS



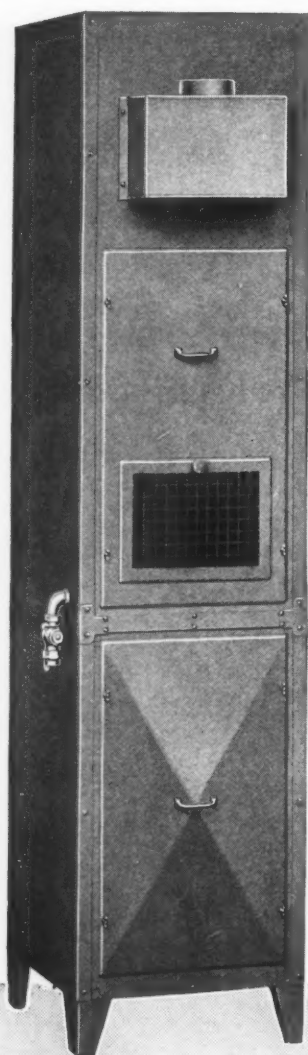
Cook

THERMOSTATS - FURNACE SWITCHES
DAMPER CONTROLS—ZONE CONTROLS SYSTEMS

Each a Leader



**The Payne Line includes
the most modern in Gas
Heating and Air Condi-
tioning Equipment.**

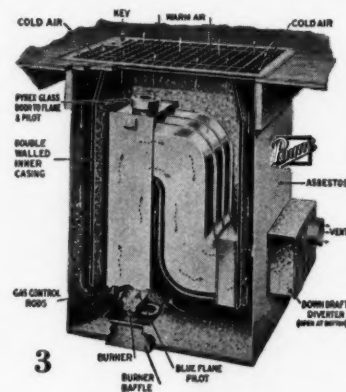


★ AS THE POPULARITY of gas heating increases Payne sets the pace in the development of new and better methods for heating and air conditioning with this most modern and ideal fuel. Payne appliances rank **FIRST** in . . .

DESIGN: The attractively designed and finished models in the Payne line have been produced with the utmost consideration for customer satisfaction. In striving for eye appeal we have sacrificed none of the features which have characterized Payne Products and helped us to build our present fine reputation in the gas heating industry.

QUALITY OF CONSTRUCTION: Twenty-three years' experience in the exclusive manufacture of gas burning appliances has resulted in the production of a line of appliances durable and dependable beyond question. The highest grade metals and materials in the hands of expertly trained workmen have produced equipment worthy to be included in any heating campaign.

EFFICIENCY: Payne appliances are thoroughly tested, first in our own modernly equipped laboratory, and then submitted for approval of the American Gas Association for efficiency, burner operation, construction, performance and safety. When offered to the trade, we can truthfully say their efficiency is in excess of the rigid requirements for these tests.



Payne

in its particular heating appliance field

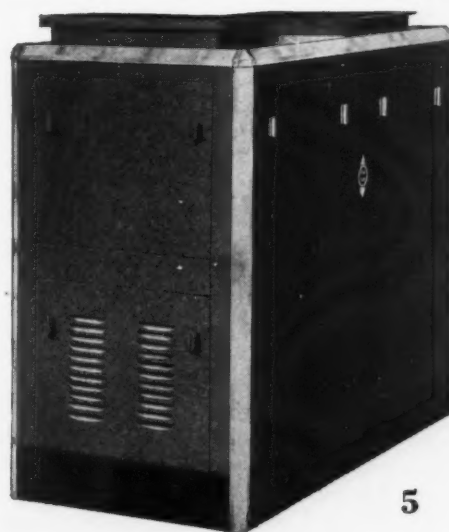
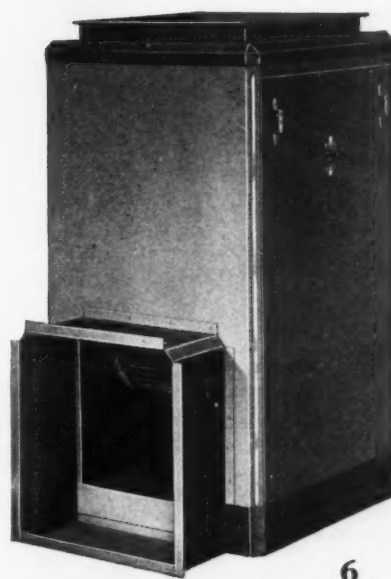
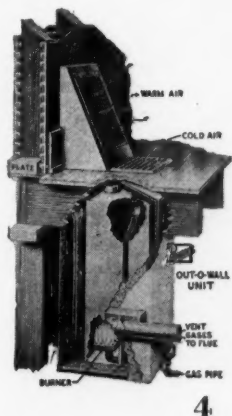
First in Acceptance by Leading Gas Appliance Merchandisers . . .

★ Heating Contractors and Merchandisers of Gas Appliances all over the country are selecting Payne Products because they find in the Payne line a well designed appliance for every heating requirement. Whether the problem is single room heating or air conditioning an entire building, it can be accomplished better with Payne Gas-fired equipment. Each product has been created with the purpose of broadening the scope of the gas heating industry . . . developing new and profitable sales features for the appliance dealer and helping him to establish an enviable reputation through customer satisfaction and good will.

There is a more selective profit building range in Payne heating equipment than will be found in any other line of gas heating products.

1. Payne Modern Console Heater
2. "FAU" (Forced Air Unit) Furnace
3. Payne Floor Furnace
4. Payne Single Register Furnace
5. Payne Winter Air Conditioner
6. Payne Modernair (Blower-Filter) Unit

*Write now for our illustrated catalog
of Payne Gas Heating Products.*



**PAYNE FURNACE
& SUPPLY COMPANY**
BEVERLY HILLS • CALIFORNIA

for every Gas heating problem



*A beautiful home
deserves a fine
air conditioning
installation*

The home of Mr. Otto G. Raymond, Washington, D. C., has the eye-satisfying beauty of the best traditions of American architecture—and it also enjoys healthful conditioned air in selected rooms, with economical steel boiler heat in kitchen, bath and garage, as well as year-round hot water at low cost. The illustration shows the Fitzgibbons equipment furnishing these three services.

This is "Split System" air conditioning—the further step beyond simple air conditioning.

You can get this with the twin units—the Fitzgibbons Steel Boiler and the Fitzgibbonsaire—or you can get it with a single combined unit—the Fitzgibbons Boiler-Air Conditioner. Both of these installations provide year-round hot water supply — tankless, if desired.

"Fitzgibbonsaire" *Fitzgibbons*
—gives cleaned, *"Oil-Eighty"* the
tempered humidified steel boiler that gives
and circulated air . . . radiator heat and
domestic hot water

The air is warmed by steam from the boiler—no direct connection between air ducts and combustion chamber, hence entire absence of "speaking tube" effect, conveying combustion sounds to the rooms. No possibility of seepage of gases in the circulated air. A quiet, sturdy unit.

Works with any good oil burner to provide outstanding fuel economies. Also built in types for stoker and gas firing. When equipped with the Fitzgibbons TANKSAVER, provides year-round tankless hot water supply.

GET THE FACTS about modern air conditioning, in the catalog describing the Fitzgibbons "Split System." Write today.

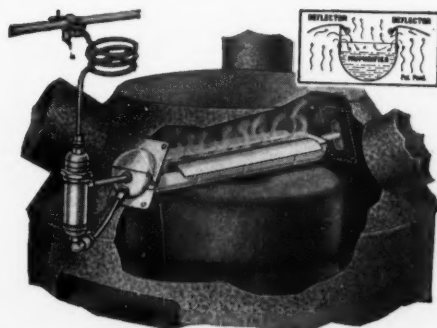
Fitzgibbons Boiler Company, Inc.

General Offices:

ARCHITECTS BLDG., 101 PARK AVE., NEW YORK, N. Y.

Works: OSWEGO, N. Y.

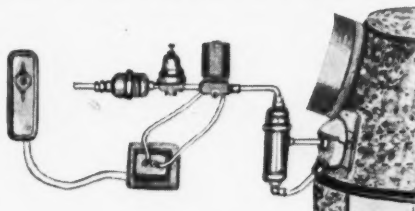
BRANCHES AND REPRESENTATIVES IN PRINCIPAL CITIES



The MAID-O'-MIST "ZEPHYR"
Automatic Humidifier

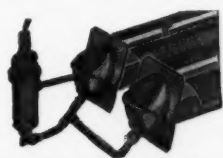
Designed for forced circulation. The pan is 4"x36" in length, stamped from genuine sheet bronze. The heating area exceeds 350 sq. inches. (Bronze metal is nine times as efficient in heat transmission as cast or sheet iron of the same thickness.) The pan is equipped with Patented wings to plane the air over the water surface. It has an adjustable hood that fits the slope of any furnace. A self-locking overflow plate permits the raising and lowering of one end of the pan to reduce the evaporating capacity in extreme cold weather to prevent oversaturation.

The Zephyr is supplied with water by a new type Water-Boy located away from the heat to avoid corrosion. The equipment includes saddle valve, copper tubing, and fittings to connect the Unit as shown. LIST PRICE \$15.50.



No. 859-CH DeLuxe Humidifier

Is the same as the Zephyr and in addition includes our No. H-4 Automatic Humidistat control, No. 640 Solenoid valve, No. 31 Pressure Reducing Valve and No. 4 Filter. LIST PRICE \$50.00.

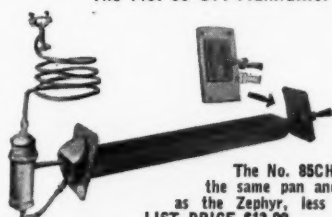


The
ZEPHYR
TWIN
Humidifier

was designed for large furnaces or where a high percentage of humidity is desired. One Water-Boy feeds both pans, but each pan can be raised or lowered independently to reduce the evaporation area.

LIST PRICE \$20.00
LIST PRICE ZEPHYR TWIN DE LUXE \$55.00

The No. 85-CH Humidifier



Pat. Pend.

The No. 85CH consists of the same pan and equipment as the Zephyr, less Air Wings.

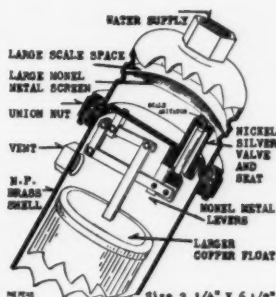
LIST PRICE \$13.00.
The No. 555-H (Not illustrated) consists of the same pan as the No. 85CH. It has an adjustable hood plate, but no patented over-flow adjustment. It is supplied by a No. 55 Water-Boy.

LIST PRICE \$9.75

TOPS

IN PRACTICAL HOME HUMIDIFICATION AND WATER-LINE CONTROLS

AUTOMATIC



THE NEW TYPE No. 85
WATER-BOY FEEDER

is just another step forward in a small, attractive, positive-acting, corrosion resisting water line control valve. It is the result of long experience in manufacturing of water feeders. All working parts mounted on a replaceable bonnet. It is finished in satin nickel. "LIST PRICE FEEDER ONLY \$8.00."



No. 55 Midget Feeder
for Bucket or Pan Types

This is a midget ball-cock 7" long over-all. It is built of Monel Metal, Nickel Silver, Brass, and Copper. The float is adjustable for any depth of water from 1" upward.

LIST PRICE \$2.25.
No. 55-F with 6-ft. 1/4" Copper tubing and No. 8 Saddle Valve. LIST PRICE \$3.75



No. 8 Pipe
Saddle Valve

To attach "quick hook-up saddle valve" to 1/2" and 3/4" water pipe, drill 1/4" hole in side of pipe, and fasten saddle bolts. Outlets for 1/4" O.D. copper tubing. LIST PRICE ONLY \$1.15.

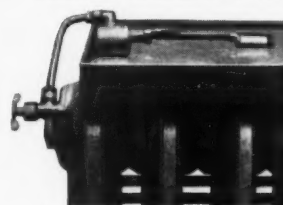
THE PUBLIC HAS BECOME HUMIDITY-CONSCIOUS

The manufacturer or dealer who fails to recognize this important fact is waging an up-hill sales-fight. Home owners now look for and demand Heating equipment that provides proper humidity during the heating season. It means better health, more comfort, economy of fuel and a saving of household effects.

As exclusive manufacturers of Humidifiers and Water-Line Control Valves, we have devoted our entire time in developing the most efficient appliances possible at a price within the reach of the Public's pocket-book—Equipment that has long-life, avoids corrosion, that is easy to install, simple to repair if need be, adjustable to fit the needs of the user, and automatic in operation.

These exacting requirements will be found in the Maid-O'-Mist line of warm air furnace humidifiers and equipment.

No. 53 Water-Pan Feeder for Radiators

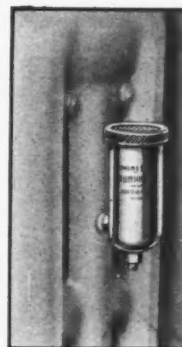


Automatically vents the air from the hot water radiator and keeps the humidifying pan full of water. LIST PRICE \$3.00.

No. 95 AUTO-VENT
HUMIDIFIER

for Steam Radiators

Takes the place of an air valve and humidifies the room automatically. Discharges one pint of vapor per hour at 1/2-lb. steam pressure. The rate of discharge may be adjusted by set screw at bottom of valve. Size 2"x4 1/2". LIST PRICE \$3.75.



Write for Price List "H" and Liberal Discounts

MAID-O'-MIST, Inc.

180 N. Wacker Drive,

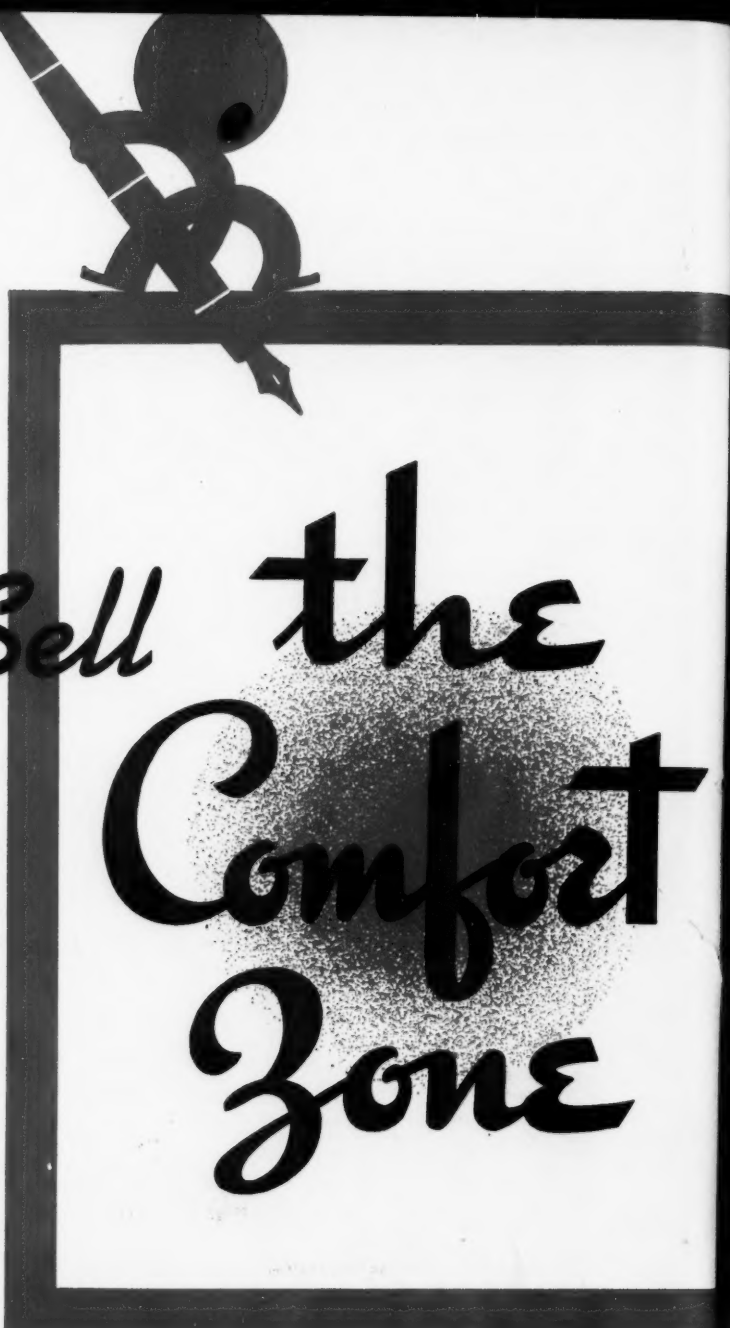
Chicago, Ill.

PENN

HELPS YOU *Sell* the

A REVOLUTIONARY
SELLING POLICY THAT
CAN SEND YOUR SALES
SOARING TO

NEW HIGHS!



the Comfort Zone

Forget the Gadgets

SELL THE "COMFORT ZONE" AND
WATCH YOUR SALES SKYROCKET

Albert Penn

PRESIDENT
PENN ELECTRIC SWITCH CO.

Here is the whole plan:

Start from here: Home owners are humans—not mechanics—they don't understand mechanical terms—and don't want to. Furthermore, they won't be bothered. So forget the gadgets, "features" and gimcracks—and tell your prospect the story he wants to hear—the story of comfort—freedom and economy.

The Penn "Comfort Zone" story is designed to get salesmen welcomed by any prospect. It is all explained by one

selling help—one clever, fascinating chart that proves that *you* have the heating device that will keep his home warm—comfortable—with effortless ease.

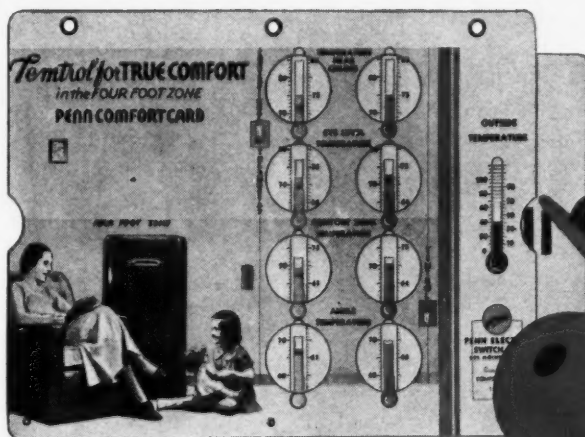
The "Comfort Card" startles the prospect into seeing that he really lives in a zone 4 feet from the floor—and that *there* is where comfort must be maintained. As you operate this "Comfort Card" right before his eyes—he sees that zero outside can make this 4-foot zone *very uncomfortable* unless he has *your* type of heating equipment—Penn controlled. It is graphic—it has motion—it holds the eye and drives the selling wedge deep into the prospect's mind—eliminating arguments—skipping mechanical discussions—humanizing the story of automatic heat.

OPEN WITH THE "COMFORT ZONE" CLOSE WITH YOUR EQUIPMENT

There in two sentences is the secret of faster, more profitable saleswork. The "Comfort Zone" story opens doors, opens minds—gets the prospect ready to buy on a *human* basis. You don't have to be an engineer to sell with this plan. Write us today for your "Comfort Card" and instructions that can produce a revolutionary upturn in your sales. There is no charge—now or later. Penn wants to help you increase your sales—no matter what equipment you sell. The Penn "Comfort Card" has increased sales for others—it will do it for you.

Copyright, 1937
Penn Electric Switch Co.

PENN ELECTRIC SWITCH
OFFICES: NEW YORK, BOSTON, DETROIT, CHICAGO
EXPORT: 100 VARICK STREET, N. Y. C. Distributors in Principal Cities



HERE'S ALL YOU NEED AND IT'S *Free*

This is the "Comfort Card" moving demonstrator—a flip of your fingers shows how your equipment—Penn controlled—maintains "TRUE COMFORT in the FOUR FOOT ZONE" at all times, regardless of outside temperatures. Mail the coupon for your copy now. All you can use—are free.

PENN CONTROLS FOR HEATING SERVICE

TEM-CLOCK • TIMETROL • TEMTROLS • LIMIT SWITCHES
UNIT HEATER CONTROLS • STOKER RELAYS • SAFTROLS
POWER GAS VALVES • FAN AND CIRCULATOR CONTROLS
And others for all standard or special heating, refrigeration, air conditioning, pump and air compressor applications.

ZIP OFF THIS COUPON

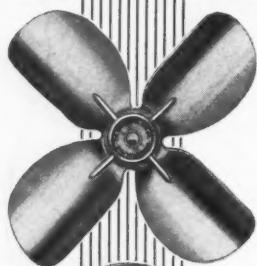
PENN ELECTRIC SWITCH CO.
Des Moines, Iowa

Send me (no charge) _____ "Comfort Cards"
No. _____
and full instructions for their operation. I employ _____
salesmen. Makes of equipment handled: _____

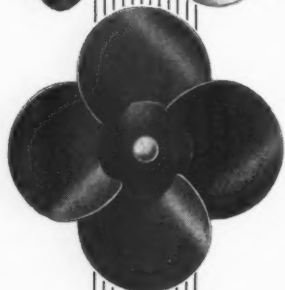
Name _____
St. and No. _____
City _____ State _____

PENN ELECTRIC SWITCH CO., DES MOINES, IOWA
REPRESENTATIVES: GARLAND-AFFOLTER ENGR. CORP., San Francisco, Seattle, Los Angeles; FORSLUND PUMP AND MACHINERY CO., Kansas City; THE UHL CO., Minneapolis; JULES BENEKE, St. Louis; MONARCH SALES, Denver.

TORRINGTON AIR IMPELLERS



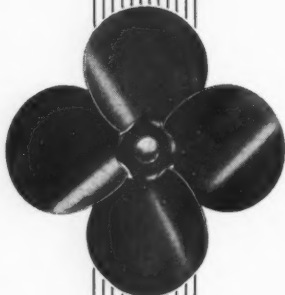
AUTOCRAT—fans for auto heaters and windshield defrosters, etc., have been the standard ever since these devices were first marketed. Made in sizes 3 in.—4 in.—4½ in.—5 in.—5¼ in.—5½ in.—6 in.—6½ in., all four blades, also 7 in. 5-blade, in one piece of cold rolled steel or aluminum with brass hubs, complete with set screw. ¼" bore is standard. Either clockwise or counter-clockwise rotation (expressed when looking at air delivery side of fan). White nickel is standard finish for steel blades. (A small size blower wheel is under development for Defroster Blower.)



AIRISTOCRAT SILENT FANS—A patented design having unique construction and attractive appearance, for which we claim quieter operation than any other propeller fan blade having comparable performance characteristics. Embodies entirely new principles in the art of fan design.

AIRISTOCRAT DELUXE MODEL—For desk, ceiling, wall bracket and air circulator fans. Constructed with a round center disc instead of a spider.

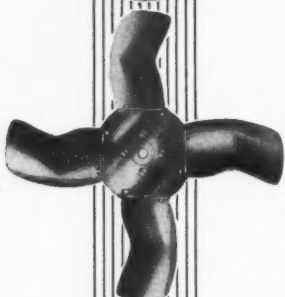
Sizes 8 in.—10 in.—12 in.—16 in. Blades hand set and statically balanced.



AIRISTOCRAT STANDARD MODEL—Same as Deluxe model but with blades mounted on a conventional type of spider, instead of round center disc for more economical construction. Priced lower than Deluxe models. Blades hand set and statically balanced.

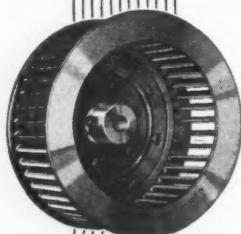
AIRISTOCRAT PRESSURE MODEL—Same as Standard Model with blades designed for moderate pressures where quiet operation is desired.

Sizes 8 in.—10 in.—12 in.—14 in.—16 in. Blades hand set and statically balanced. All Airistocrat models have four blades, for clockwise rotation. Hubs of brass, blades of steel or aluminum, any finish. Hubs bored to suit.

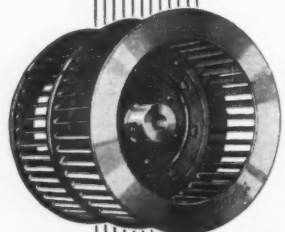


VARIPITCH PRESSURE FANS—Newly patented variable pitch blade. Designed primarily for unit heaters. Its scientific construction enables it to operate against pressures with a high efficiency. The patented adjustable blade feature permits manufacturers to stock fewer sizes. 8% greater condensation obtained in unit heater, with same air volume and power consumption, because of uniform velocity across entire disc area of blade.

This blade will be marketed in 1937. First sizes will be 18 in.—19 in.—20 in. Other sizes, both larger and smaller, will follow. Details upon request.



TORRINGTON ALUMINUM BLOWER WHEELS—are unexcelled for smooth and quiet operation—have established today's quality standard. Lighter in weight than other wheels, the starting torque and power consumption is less. Rugged, non-resonant, non-rusting, good looking, efficient, quiet. Every wheel hand inspected and statically balanced. Ratings available for all sizes. Bulletin gives data for housing scroll design. We do not build housings.



Our Policy To build better air impellers for every application. Every Torrington fan has resulted from scientific research and development under experienced engineers in a laboratory fully equipped for the study of aerodynamics. . . Other new Torrington models are under development. Get on our mailing list and you will be kept informed on important new fan developments.

AIR IMPELLERS SINCE 1885

THE TORRINGTON MFG. CO. TORRINGTON CONN. U.S.A.

A MOST
COMPLETE AND MOST
PROFITABLE LINE OF FURNACES

VICTOR

HEATING EQUIPMENT

● Here's a complete line of high grade air-conditioning units and heating equipment. A line that enables you to buy all your requirements from one reliable source. You can install a complete Victor Heating Plant and be certain each item will work perfectly and give the maximum in service and results.

THE FURNACE WITH FUEL-SAVING

HEAT RADIATING FINS

● A miniature electric furnace that can be carried into the home of your prospect PROVES the superiority of Victor Fin Radiation. This exclusive feature puts you in a class by yourself and is another Victor Dealer Sales Help that closes sales for you at a profit. Investigate this money-making line. Write or wire.



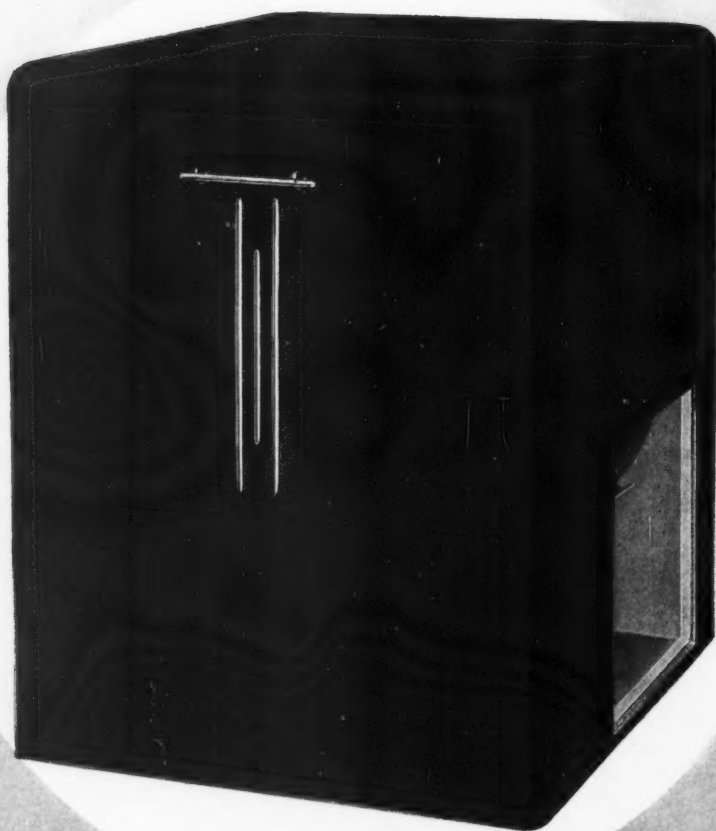
Victor Demonstrator

HALL-NEAL FURNACE COMPANY
VICTOR HEATING EQUIPMENT
GOOD SINCE 189
INDIANAPOLIS, INDIANA



LAU

Presents • A NEW **1937 PACKAGE UNIT FURNACE BLOWER**



S700 Series

Striking a new note in beauty . . . a new knock-down package unit blower with a smooth, rounded surface in a baked Morocco finish with chromium trim and door handles. Complete with MINNEAPOLIS FURNACESTAT CONTROL, VARIABLE SPEED DRIVE, Motor, Filters, Blower, Blower Cabinet, and Two Full Size Access Doors. NO EXTRAS TO BUY! 12 sizes to meet all requirements! New LOW prices! And a host of exclusive new features developed and introduced for the first time in the new 700 series.

Write for 1937 catalog, simplified selector chart, data and prices.

New England Representative
WIDGER-MILLER CORPORATION
614 Memorial Drive
Boston (Cambridge), Mass.

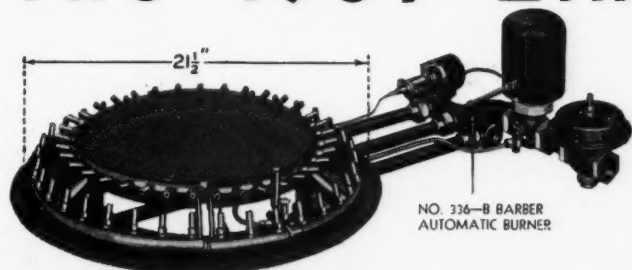
Pacific Coast Representative
L. W. SWIGERT
1912—21st Ave. North
Seattle, Washington

LAU BLOWER COMPANY

DAYTON • OHIO

The 1937 Line of BARBER BURNERS

Offers You Products That Will SELL and PERFORM

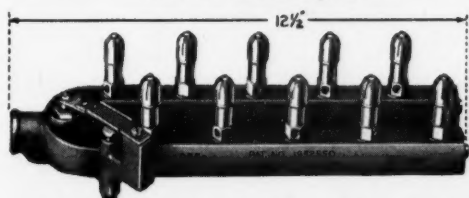
NO. 336-B BARBER
AUTOMATIC BURNER

Conversion Burner for Round Furnaces or Boilers

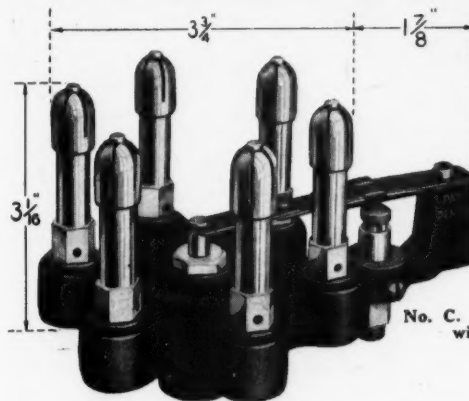
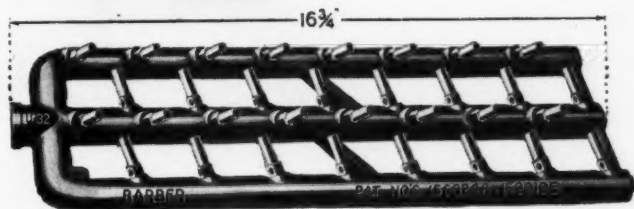
Made in eight different sizes to handle round grate diameters from 12" to 34". Also tailor made to suit and fit the grate dimensions of oblong furnaces and boilers. Insures proper scrubbing flame action on side walls of firebox, and the 1900° Flame Temperature develops the highest possible efficiency and economy. Equipped with Baltimore Safety Pilot for positive and accurate Safety control. Listed in the A. G. A. Directory of Approved Appliances.



No. X-44 Barber Burner Unit

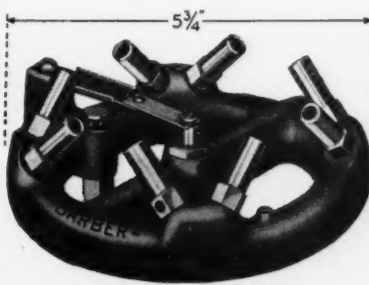


No. C. U.-90 Barber Burner with Safety Pilot

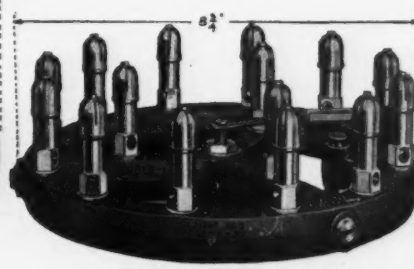
No. C. P.-61 Barber Burner
with Safety Pilot

No. U-32 Barber Burner

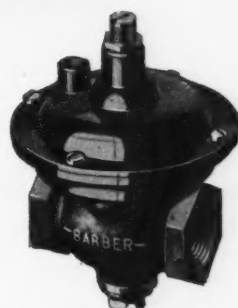
A FAR MORE complete range of improved Barber Products now awaits your acceptance. It's worry off your mind, to familiarize yourself with Gas Burning Equipment which is really PERFECTED. Shown here are merely a few items from Barber's wide selection of Gas Burners for numerous Appliances, Gas Pressure Regulators, and Controls. Get the **WHOLE** story! We offer you the experience and facilities of our Engineering Department for your Gas Burner problems. Write today for No. 37 Catalog and Revised Price List.



No. S. P.-15 Barber Burner



No. C. P.-150 Barber Burner

Barber Gas
Pressure Regulators
A.G.A. Approved

Made in the following sizes: $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1", $1\frac{1}{4}$ ", $1\frac{1}{2}$ ", 2".

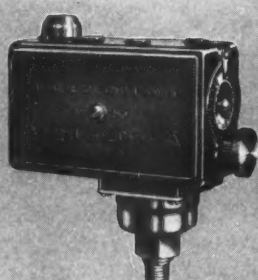
BARBER BURNERS and Regulators are Adaptable to Such Appliances as:

Air Conditioning Equipment
High Pressure Boilers
(Tubular and Tubeless)
Bakery Ovens
Doughnut Kettles
Metal Pots
Garage Heaters
Coffee Urns
Hair Dryers
Space Heaters
Floor Furnaces
Clothes Dryers
Water Heaters
Confectioners' Stoves
Vulcanizing Machines
Pressing Machine Boilers
Japanning Ovens
Core Ovens

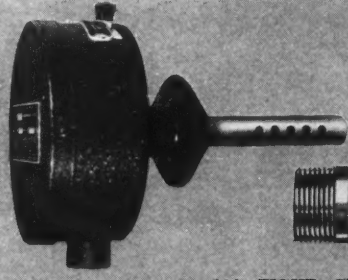
Banana Room Heaters and many other Appliances

THE BARBER GAS BURNER CO., 3704 Superior Ave., Cleveland, Ohio
Address Michigan Inquiries to The Barber Gas Burner Co. of Michigan, 4475 Cass Ave., Detroit

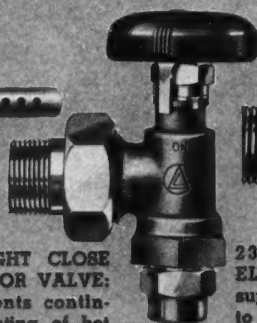
BARBER *Automatic* JET GAS BURNERS

**DEPENDABLE
CONTROL**IS THE VERY
heart OF**AIR CONDITIONING**

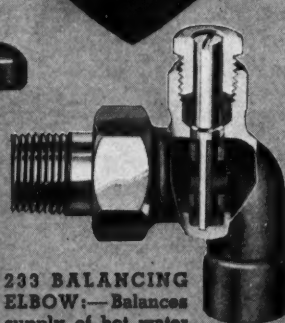
250 LIMIT CONTROLS:—For low or high pressure steam—Clamp-on or Immersion for hot water. Also for vapor, vacuum, etc.



255 FURNACE LIMIT CONTROL:—No. 244 Fan Switch also available



902 TIGHT CLOSE RADIATOR VALVE:—Prevents continued heating of hot water radiator after being shut off



233 BALANCING ELBOW:—Balances supply of hot water to each radiator—essential when circulator is used



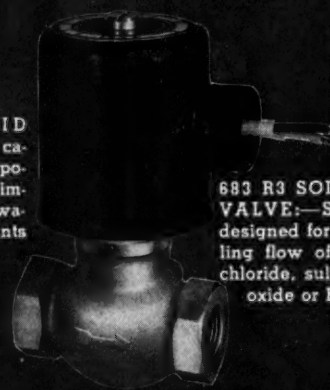
TWO-ELEVEN THERMOSTAT:—Sensitive, accurate, durable—with or without compensation (pre-heater)

GRAVITY OIL BURNER ACCESSORIES • POWER OIL BURNER ACCESSORIES • REFRIGERATION EQUIPMENT

250 REFRIGERATION CONTROLS:—For pressure or temperature, with or without high side cut-out



686 SOLENOID VALVE:—Large capacity ($\frac{1}{2}$ ") incorporates important improvements—for water and refrigerants



683 R3 SOLENOID VALVE:—Specially designed for controlling flow of methyl chloride, sulphur dioxide or Freon

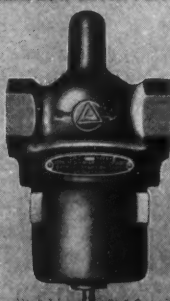
AIR CONDITIONING CONTROLS • STOKER CONTROLS • GAS BURNER CONTROLS • ROOM THERMOSTATS

(At Left) **CRC 270 PRESSURE REGULATING VALVE:**—Serves dual purpose of regulating fuel pressure at nozzle and preventing flow during "off" periods

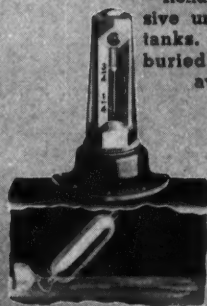


(At Right) **CRC 236 SAFETY FLOAT VALVE:**—Manual and automatic—complete fuel control for gravity burners

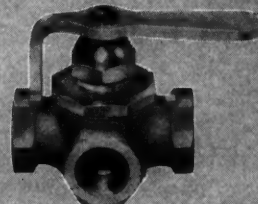
CRC 100 ANTI-SYPHON VALVE:—In one unit, an anti-siphon valve and return flow check valve

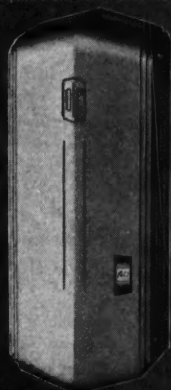


CRC 425 FUEL STORAGE GAUGE:—Reliable, inexpensive unit for inside tanks. Gauges for buried tanks also available



CRC 520 THREE WAY VALVE:—Eliminates need for separate shut-off valves on twin tank installations





197 HUMIDISTAT:—Sensitive, reliable humidity control styled to match the Two-Eleven Thermostat



683 W2 SOLENOID VALVE:—Silent and thoroughly reliable in control of water for humidification



291 SELF CLEANING SPRAY NOZZLE:—Eliminates clogging and consequent servicing where humidification is installed

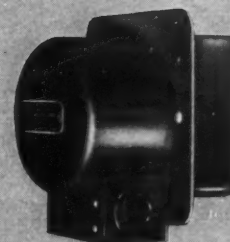
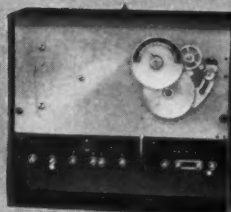
PRESSURE CONTROLS • TEMPERATURE CONTROLS • VACUUM CONTROLS • HUMIDITY CONTROLS

691 DIFFERENTIAL THERMOSTAT:—For Summer cooling, controls by the DIFFERENCE between indoor and outdoor temperature according to ASHVE Comfort Curve



431 MOTOR UNIT:—For Zone Control. Provides inexpensive means for individual control in zoned heating

384 STOKER TIMER:—Control with relay-transformer as illustrated. Supplied also with hand safety switch and as timer only

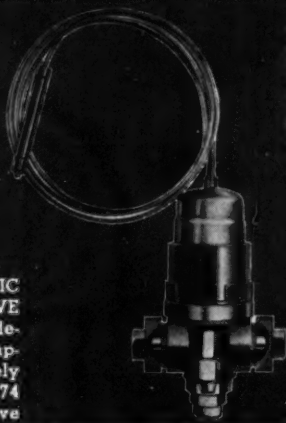


298 RELAY TRANSFORMER:—Small compact combination of relay and transformer which operates silently

LOW WATER CUTOUTS • TRANSFORMERS • RELAYS • HEATING CONTROLS • REFRIGERATING CONTROLS

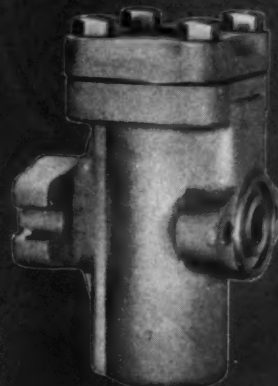


673 THERMOSTATIC EXPANSION VALVE:—Scientifically designed to keep evaporators completely refrigerated. Also 674 non-adjustable valve



785 THERMOSTATIC EXPANSION VALVE:—Large capacity for air conditioning—capacity up to 20 tons on Freon. Smaller sizes 10 tons and 6 tons

782 STRAINER:—Designed for use with large thermostatic valves or solenoids—bolts directly to valve flanges



AVAILABLE AT LEADING JOBBERS THROUGHOUT THE COUNTRY

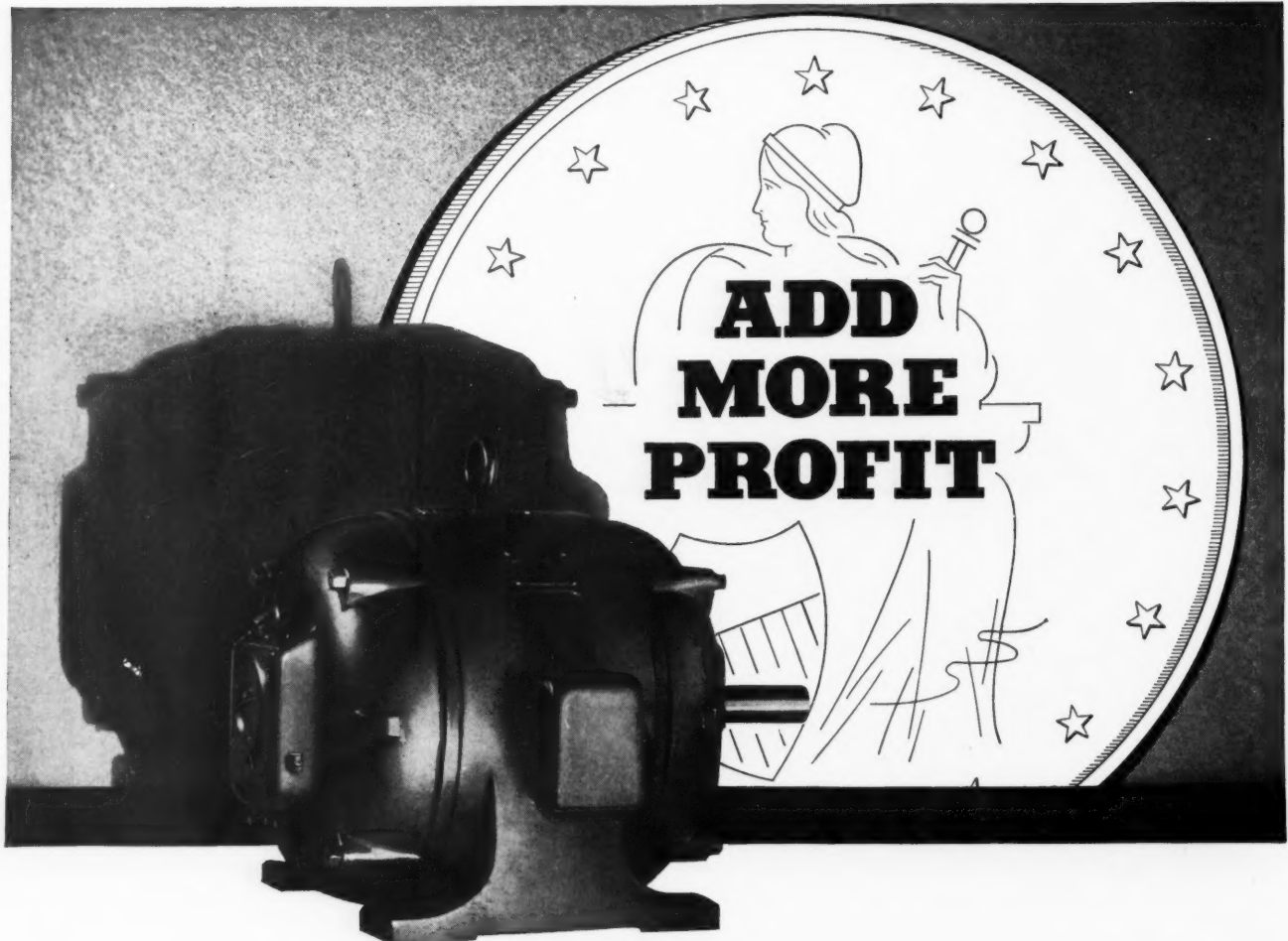
DETROIT LUBRICATOR COMPANY

5900 TRUMBULL AVENUE • DETROIT, MICH. U. S. A.

NEW YORK, NEW YORK—40 West 40th Street
CHICAGO, ILLINOIS—816 South Michigan Avenue

Canadian Representative—RAILWAY AND ENGINEERING
SPECIALTIES LIMITED, Montreal, Toronto, Winnipeg





**More than 800 total Horse Power
of Century Motors in the
St. Louis Municipal Auditorium**

Sizes from 1/2 to 60 Horse Power

Driving Fresh Air Supply Fans, Exhaust Fans, Dehumidifying Pumps, Circulating Pumps, Pressure Pumps, Air Compressors, Curtain Hoists, Generators. This is only one of the many large installations where Century Motors are adding more value to the benefits of Air Conditioning.



Air Conditioning

Now—when you are thinking about Air Conditioning for next summer—and the profits that come from increased sales, efficiency, and production as the result of customer comfort and better working conditions

Remember—Century Motors add these essentials to any Air Conditioning installation:

They start quietly—run quietly—are remarkably free from vibration.

These features are Century's distinct contribution to QUIET Air Conditioning.

CENTURY ELECTRIC COMPANY

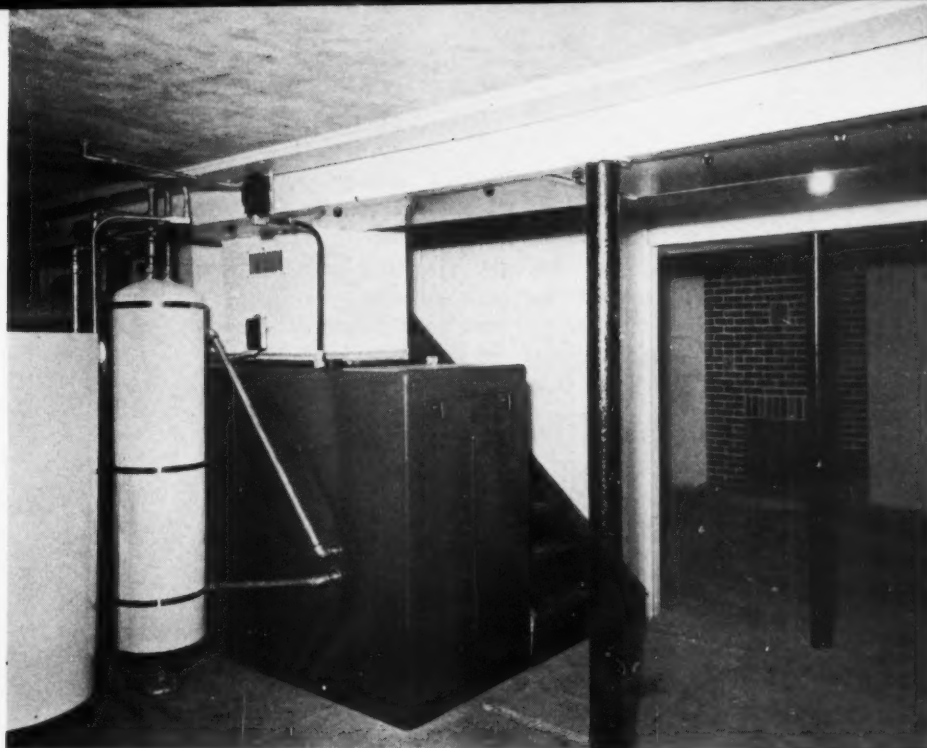
1806 Pine Street

St. Louis, Mo.

Offices and Stock Points in Principal Cities

SIZES UP TO 600 HORSE POWER

This photograph shows the oil fired warm air furnace used in the plan in Fig. 2. This is in the home of Louis F. Crosby, Comptroller, City of Ft. Wayne, John R. Worthman, Designers and Builders. The warm air rises through the bonnet and flows through the duct indicated by the row of damper quadrants. Each quadrant controls the air supply in the pipe opening into each joist space.



An Engineering Approach To True Comfort Heating

By Everett S. Buck

Consulting Engineer, Ft. Wayne, Ind.

THE time has come for the warm air, air conditioning industry to discard "70 degrees at the breathing level throughout the house in zero weather."

Other types of heating, still cutting their eye teeth in air conditioning, may continue to emphasize this specification, but the warm air industry, long since out of its swaddling clothes, is now ready to talk of true human comfort.

What, first of all, makes for bodily comfort?

The human body has a range of only a few degrees of temperature tolerance. Its thermostatic system, more sensitive than any mechanical gadget man has yet invented, through the processes of radiation, convection, evaporation maintains a set temperature on the interior of the body of 98.6 degrees, but the surface temperature is 75 degrees. All comfort conditioning should be aimed at assisting the body to maintain this 98.6 inner and 75 outer temperature.

This body thermostat makes use of all three heat loss methods. If the air surrounding the body is humid and evaporation thereby retarded, convection and radiation are used. If subtending surfaces are so high in temperature that radiation is eliminated, evaporation and convection increase. If there is no air movement, hence no convection, radiation and evaporation are used.

We see, then, that to make the human body comfortable we should supply air movement, not too fast

or too slow, but just sufficient to keep the immediate blanket of air surrounding the body in movement. We cannot have cold walls or cold objects for such cold surfaces increase radiation loss and we can be cold even though the immediate body air is 75 degrees. We must supply air which is not too dry (for this increases evaporation and so chills the skin) nor too humid, for this completely prevents air evaporation.

Here, then, lies the key to body comfort.

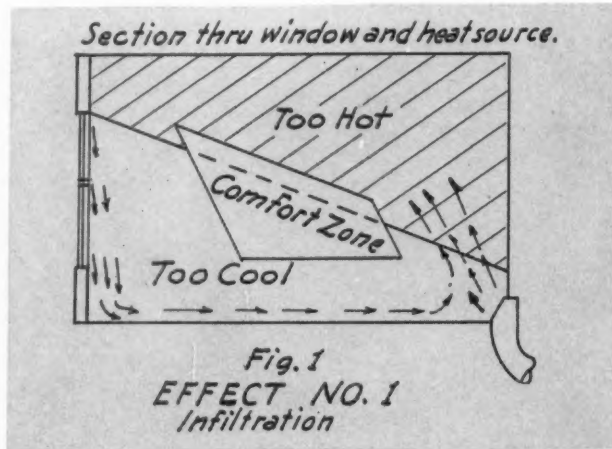
Where "70 degrees at the breathing level" falls down lies in the fact that room air may be 70 degrees, but cold wall and glass areas attract bodily radiation and we feel chilly. Or drafts of 65-degree air across the floor may chill the ankles by convection and evaporation and the lower part of the body will feel cold. Or a blanket of hot air at the ceiling may re-radiate heat downward onto the upper part of the body while the feet and ankles are cold and we are decidedly uncomfortable.

The logical solution of this problem is presented as an American type of panel heating. Not a panel type of heating in which ceilings and walls are kept warm by means of buried coils or wires, but a warm air system of panel heating in which the floors are kept at a temperature above 95 degrees and radiation to cold walls is offset by placing a sheet of warm air between the body and the cold wall or glass.

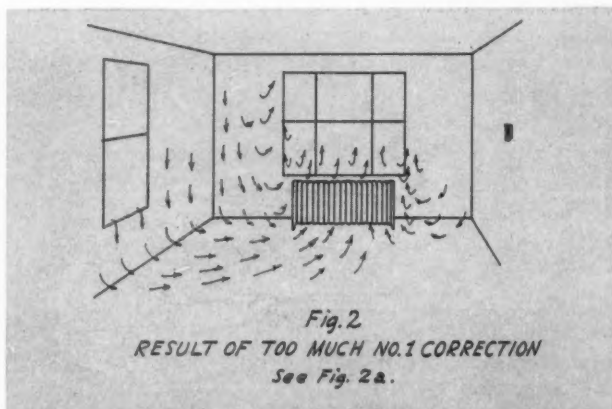
This method is not an engineer's dream. It has been

used in a number of houses in two variations and with uniform satisfaction. To understand completely just what this method will do let us follow the conditions in an average house during the heating season while the owner attempts to keep comfortable.

Suppose the outdoor temperature is falling. The first effect is upon the air that simply cannot be prevented from entering at an hourly rate varying from 50 to



200% of the total volume of inside air. It begins to enter faster and drop to the floor more rapidly because it is colder, hence, heavier. For a short time, this cold, outside air will absorb heat from the 70-degree floor, which soon becomes too cool for comfort. This effect gradually creeps up to the thermostat, but not until the feet and legs have become badly chilled. The heater starts, but no matter how the heat is supplied to low "spot type" radiators or registers, the column of warm air they produce rises promptly to the ceiling. (See Fig. 1.) Before this air can get back down to the floor, it must pass the "thermostat" which will

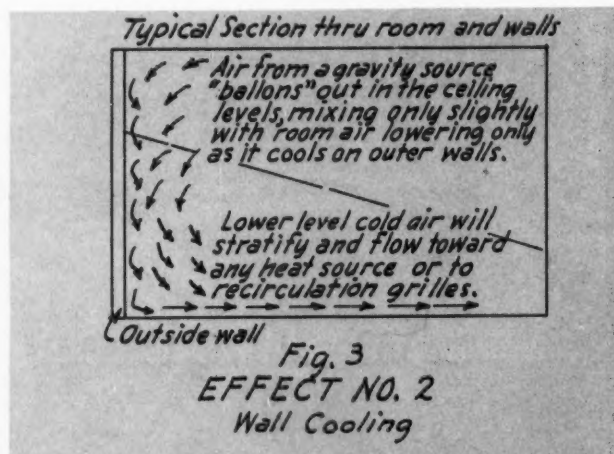


respond just as promptly to stop the heat flow as it acted to start it. Even assuming that it might evade the stat and miraculously get back down with enough heat left to warm that cold floor, there are other influences acting to prevent such beneficial result.

Effect No. 2 is that the outside walls become cold, over their entire inner surface. The only force acting to prevent this is the warm room air rubbing on the wall, and this air takes a downward direction as it cools and becomes heavier than the air that is not in contact. (See Fig. 3.) This cool air drifts out across the floor, but not without a part of it being put into

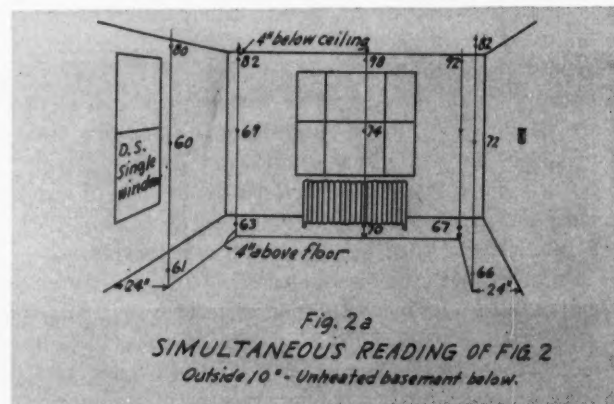
active and disagreeable motion by a force that is commonly overlooked by designers; the ejector or "chimney" effect of a large column of air. A kata thermometer will often reveal an ankle height velocity of 150 feet per minute toward such a heat source. (See Fig. 2.) Already too cold, the effective temperature of the air becomes three degrees colder, as a result of this velocity. (See Fig. 2a.) These are actual, accurate readings from a room where steam pressure had been constant for 29 hours.

If this air column were divided into many small jets or a thin sheet, it could not sustain its high start-



ing velocity. (See Figs. 1a-3a.) This is analogous to a hose stream if the nozzle is replaced by a sprinkler head with wide angular diffusion. The same quantity is being delivered by the same force, but it is meeting a vastly greater area of still air inertia resistance.

Thus far we have considered only the convection phase of our problem and a means for correcting the most common error. It is not a complete solution and

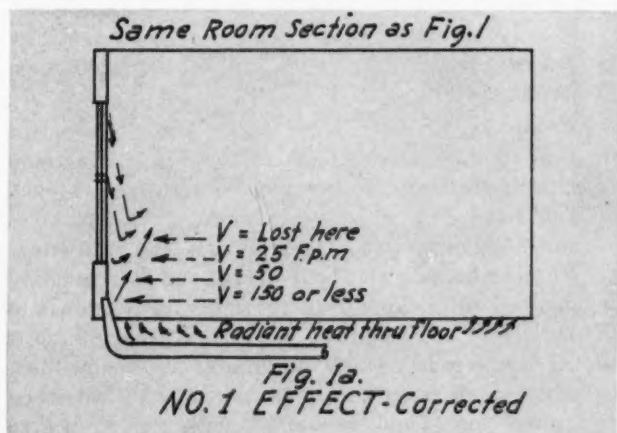


can only be done in the original design, by disposing our heat supply over wider areas.

But our homeowner is still trying to get warm. He pushes the stat up to 75° or 80°. If the ceiling is held at 90° long enough, he finally gets a little warmth at the floor by radiation from this hot ceiling. It is wasteful and productive of upper body perspiration and headaches, but it is that—or fur boots—which are rather inconvenient. If we could walk on the ceilings like a fly or turn the ceiling over like a rotisserie, we could solve the problem.

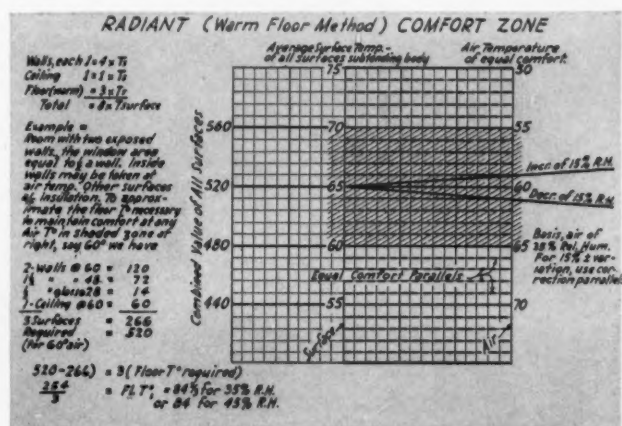
Now, let us look at the condition of too rapid heat removal from the body by evaporation. As every one

knows, yet does not seem to quite understand, evaporation is caused by the capacity of air to absorb additional moisture in ever increasing quantity as its temperature is increased. Thus, the same air that is satur-



ated when containing 26.5 grains of water vapor per pound at 32 degrees is only 19 percent saturated at 75 degrees, though it still has the 26.5 grains per pound of air. Simply expressed, its refrigerating capacity has been increased by heating for by changing its relative humidity from 100 percent to 19 percent we have given it increased power to evaporate. We want to reduce this refrigerating effect, but we dare not add even the 20 grains to make 35 percent relative humidity at 75° because the inner surface of single window glass reaches 32° when the outdoor temperature drops below 20°, and the added 20 grains will all condense and run down onto the sill, the plaster and the floor.

Now we come to the third way by which the body loses heat—the long neglected, little understood or appreciated radiation. Given a cold floor, cold exposed

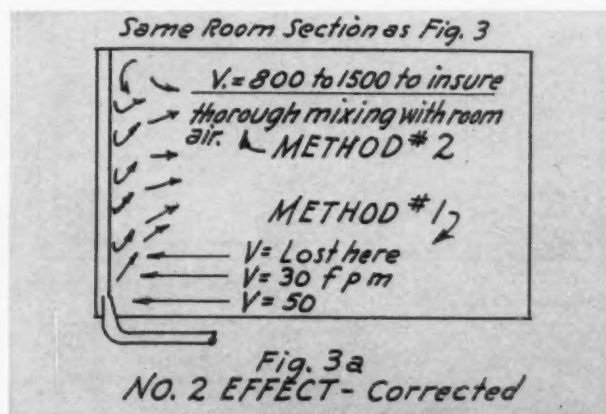


walls and windows, the body will lose from a third to a half of its heat by radiation. We have seen that there would be no body heat loss by radiation if all the surfaces subtending it were held at body surface temperature of 75 (See Comfort Chart)), but there are no data tending to show that this is good for the body.

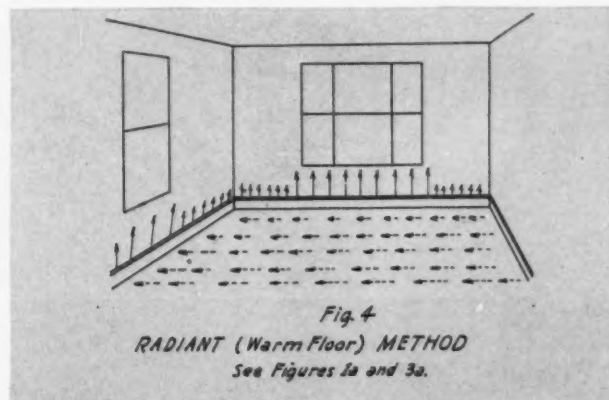
There is no essential difference between low temperature radiant heat and radiant heat at such an intensity that the glow of the heat source is visible. Mathematically, the heat transferred varies as the receptive function of the cold body (k) times the difference

between the fourth powers of the absolute temperatures of the hot and cold bodies. For a surface at 76° and the human body at 75° we have, roughly: Radiant Heat = $k (536^4 - 535^4)$. Obviously the heat transfer increases at a tremendous rate as the temperature difference widens. However, this is qualified by the same law as that of light, and the reception will vary as the square of the distance from the source.

This makes it clear that we must keep our heat source quite close to the body if we are going to use economically low temperatures. For comfort, this in-



dicates that the floor will be about three times as effective upon a person at random points over the room area as any single wall would be. (See Fig. 4.) It would seem to be better than the ceiling, if we consider that we comfortably go bareheaded in very cool weather, but we do not go barefooted. Uncontrollable air motion has no chance to exist over the surface of a floor that is receiving a reasonably steady or even a rather widely cycled intermittent supply of heat. A cold breeze that starts out across it from some unusually large and cold window simply cannot move far until it is made warm and thus, is acquiring a constantly accelerated tendency to rise, which prevents



lateral movement. If this section of floor is cooled to a lower temperature, it will receive heat at a wider temperature difference during the next cycle.

Undoubtedly, there is merit in the plan of using wall surfaces for low temperature radiant heat sources, but let us keep in mind that it is wasteful to back-insulate and attempt to maintain the outer walls at 75, or body surface temperature, while somehow supplying the heat for the entering air and that lost through the cold windows. This additional heat requirement op-

Which houses in this picture would you canvass in seeking prospects for air conditioning? Actually every home owner on this street was canvassed and every one was sold! This article—the first of a series forming a manual of merchandising—discusses that argumentative question—canvassing.



Where's That Prospect?

By R. Louis Towne

THERE they go! Young Mr. and Mrs. Samuel America. He has just received his weekly pay check of \$11,000,000,000 and they are off to the automobile dealer, the radio dealer, the refrigerator dealer, the grocer, the clothier, the railroad, the vacation spots—and all the other commodity producers and sellers that go to make up this great American industry of ours.

Each dollar of that eleven billion will be spent according to the wants and desires which have been cultivated by American industry, each branch of which is not so much concerned with meeting competition within its own field as it is concerned with meeting the competition of other fields.

This is a problem particularly acute in the newest of industries—home air conditioning.

All of that eleven billion dollar pay check is being spent.

Only a very slight portion of it is being spent to purchase home air conditioning equipment.

Our common problem, then, is to make people dissatisfied with their present comfort and lead them to allot a part of every dollar they spend for heating and air conditioning instead of for some other commodity. The only way this can be accomplished is to prove conclusively to Mr. and Mrs. Samuel America that home air conditioning and proper home heating equipment is more important to them than some other product.

We, as an industry, must educate to create wants and desires and it is an established fact that the

fastest possible means of carrying on this educational campaign is through *planned* merchandising and selling.

Only a few short years ago the mechanical refrigerator was introduced for the farm and for rural districts. There was no particular thought given the fact that the mechanical refrigerator would find a ready market in cities where ice was easily available. It was marketed primarily as a substitute for ice in places where ice could not be secured. Then the far-sighted manufacturers began to see the real possibilities of the mechanical refrigerator and it is universally agreed that the educational and merchandising job done with this product has been one of outstanding unusualness.

We are engaged in the business of *selling* air conditioning equipment. Our equipment is as important to the welfare of the home as anything on the market. By this is not meant any other existing air conditioning equipment, but any other fundamental American necessity, such as the automobile, the radio, the washing machine or the vacuum cleaner.

We must develop our market and, to develop it, *we must first find it.*

The average contractor operating in a locality in which he has done business for years may ask, "Why should I study my market? I know my community, I know the people, I know what the sales possibilities are, and I have been doing a good business over a period of years." On the face of it, this question would seem to eliminate the necessity for modern or ap-



There they go. Young Mr. and Mrs. America with 11 billions to spend every week on the products most appealing.

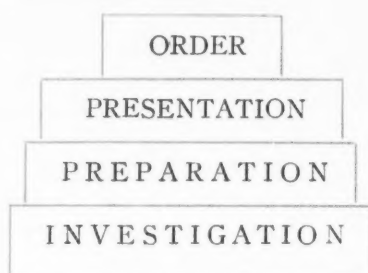
proved merchandising surveys, but if we probe just a little deeper, we will find that although the community may be known, the overall sales possibilities understood, yet the actual placement of the greatest number of installations in the particular territory or community is exceedingly vague.

The one way to check up on this is to take an entirely different attitude toward your business than you have ever taken before. As you read this now, put down the magazine a moment and look about you. Imagine for just a few seconds that you, a skilled and experienced contractor, have just purchased this business and have only this morning taken possession of it. What is the first thing you would do? Doesn't it sound logical that you would first take stock of the equipment, of the help, and then of the particular sales possibilities? These things are necessary to your functioning and all of them must be given due consideration if you are to be successful in this new venture of yours. We shall pass over the equipment and the personnel insofar as they make up your operating staff, for now we are specifically and particularly interested in sales only.

Your Business Like All Others

Although your business may be relatively small, it operates on exactly the same principle as does the million dollar corporation. In such a million dollar corporation, when a new product is ready for the market, the first question that the management asks is "Just what is the market and where is it?"

The Research Department then begins to function, studies the most likely looking territory to see what is the immediate sales potential for the market. The entire sales program is then set up much the same as yours might be set up. This sales program may be thought of in the form of a pyramid. This pyramid is built of the following blocks:



You will see that the base of this pyramid is *Investigation*. It is the foundation of all of your sales efforts and, while reducing it to a written formula may make it sound a trifle theoretical, if you will stop to consider a moment, you will see that no sale can ever be made unless proper investigations of the circumstances are first completed. We must investigate our market, then, to find this Mr. and Mrs. Samuel America with their \$11,000,000,000 weekly income.

We are not in business for 30, 60, or 90 days, but for a long pull. We intend to build our business solidly so that in ten or fifteen years it will not only reach a maximum in volume, but also a point of solidity which insures its constant operation in the future.

For that reason we must realize that the greatest single asset in our business is *prospects*.

Prospects are the bank which we must draw on from time to time and to which we must add if we are ever going to be in a constantly progressive position. Statistics gathered by some of the largest sales, advertising, and survey agencies in the world show that on the average we must have *thirty* prospects in order to have *five* good closing prospects. That simply means that out of every 30 people we contact there is a chance that we can sell 5 of them. Out of the 5 closing or really class AA prospects we turn up in the 30 contacts, we actually have for a mathematical certainty *one* sale. The other four are on the fence, so to speak.

Now, it is easy to understand that if our sales are built on such a small ratio, we must have literally



On the canvass call—be dignified. Stand back far enough so Mrs. Housewife can look you over. You don't have to act like a door "footer-opener."

hundreds of prospects to contact throughout the entire year in order to keep closing business continuously. If we do not, we are apt to have a sales curve which will fluctuate wildly from the busy to the slack season. It is during the slack season that our sales expense increases by leaps and bounds as compared to the amount of business being written.

That Replacement Market

At first glance, it seems that 30 prospects is an inordinately large number of people to contact in order to have only 5 chances to close a sale, but this is not nearly so bad as it seems. One of the largest manufacturers of air filters has recently published a survey which proves conclusively that one out of every four furnaces in the United States should be replaced. In one northern city alone a recent survey made locally and in which over 75,000 people were contacted showed 20,000 furnaces over ten years old. It is true many of these need not be replaced for many years, but it does give some idea of the vastness of our market and

how easy it is to unearth good prospects if we will only go out and dig them up.

Sources of Names

There are several ways of obtaining information on your territory. First, you can study the census reports of your city, get all the information on incomes from the Government for your particular locality, break these down into districts and, if possible, get hold of a map which shows the city in which you live divided into square mile areas. With very little computation, you can then mark in the amount of saturation and the sales possibilities in each square mile, so when you



In canvassing—watch the housewife's expression. If it's skeptical, move up and sell her your "leave piece."

wish to open intensive campaigns, you will know where to concentrate your greatest effort and where advertising, canvassing, and other sales efforts will be almost wasted.

Very often the manufacturer whose equipment you are handling has pertinent information on actual markets in your particular locality. With very little difficulty you can obtain from these manufacturers information which you, in turn, can use for your sales analyses. You will also find your local real estate dealer an excellent source of information. You might possibly work out some basis with him so that he might be paid a small fee for reporting such pertinent information to you. In this instance, do not think so much about the actual prospect to contact, but, rather, the overall number of furnaces possible to replace or for which to sell additional equipment. The real estate man in inspecting so many homes and buildings has an excellent opportunity to collect this information. His files often show conditions of buildings and residences he has listed for rent or sale and, if you can go over this card file of his and take off the description of the

home and the type of equipment within it, you will find this information to be of invaluable aid.

Exchange of Prospects

One enterprising contractor in a middle eastern city has gone so far as to form an amalgamation of all types of contractors in his town. This group of amalgamated dealers reports on all conditions of the home whenever any of them are called for repair work. For example, your local lumber dealer might be in an excellent position to tip you off to outmoded heating equipment when he is called in to repair storm windows or some other job. You, in turn, might reciprocate by giving him information on such additions or repairs as are needed when you happen to contact a particular home. With very little difficulty these sources of information can be tapped and can save hundreds of dollars because they will save so much time and effort.

In preparing your market for an actual canvass or census, there are certain rules which are now followed as a general practice because they have proved themselves to be so efficacious. Almost without a single exception any national manufacturer who has made a study of canvassing now prefers to have the prospect prepared in some way for the canvass or census call before the actual call is made. Here, again, you can call upon the manufacturer whose equipment you are handling or at least seek his aid and advice. There are many types of direct mail pieces which do prepare the home owner for a call from you. They can either be sent out by mail or distributed from door to door, the former being the most preferable method. When you then go to make your census call your prospect at least has some idea of what you are trying to talk about and you will find such preparation will open many doors otherwise closed to you.

Don't Waste a Single Call

Census taking in itself is probably the most difficult way of originating prospects. However, in spite of the fact that it is very hard and difficult work, it is by far the most effective known. Contractors often say, "Oh yes, I know. I have tried that and I don't feel that it is worth the effort." However, if you can stick to a definite program, you will find that census taking becomes easier as time goes on, the reason for this being that as you become more experienced in the handling of this type of call or as your sales force becomes more experienced, you will find they can make every call count for something, which is the important thing to bear in mind.

Make every call count—how important that is.

How often the canvasser upon finding miscellaneous resistances either turns away—or leaves his card—or says "I'll call again"—or in some other way wastes the call. Instead, he should make use of a "leave piece." Some pamphlet or folder—not simply to hand out as he turns away but to sell—explain—emphasize. Show the woman the piece—be sure it's new and clean and sell it—go over it page by page. It will continue to sell for you after you've gone. It's accumulated effort of years of sound advertising experience and skill—why

(Continued on page 140)

This "Price per Opening" Buzz Saw

By R. C. Nason

FIELD surveys conducted during the early winter indicate that air conditioning contractors will be money ahead if they scale all metal work carefully and figure all fabrication and erection according to the peculiarities of each job rather than base costs on the short-cut method of price per opening.

There are many contractors who declare that the "price per opening" is absolutely inaccurate; that it is impossible to estimate on this basis. There are others who approve "price per opening" and assert that they find the business profitable.

Obstacles to estimating by the price per opening method are many. Some of the obstacles are: differences in practice between residential and commercial jobs; whether ducts are or are not insulated against heat loss, cold loss and noise transmission; the number of supply runs compared to return ducts and how the latter are made; differences in length of piping, stacks, fittings, etc.

Equally important in pricing air conditioning work are: whether jobs are in new or old structures; whether builders have made duct and register openings or whether the sheet metal contractor has to cut the openings; whether plans are already made and are available, or whether the contractor must make his own drawings; whether return registers are to be in walls or floors; whether registers are in the floor, baseboard or high side wall.

From top to bottom—just a few headaches of the "price per opening" advocate. How much shall we add for fitting new ducts to old openings (top); or to remake interiors for stacks (center); or compensate for the cost of some designer's efficient (but dangerous) fitting (bottom)?

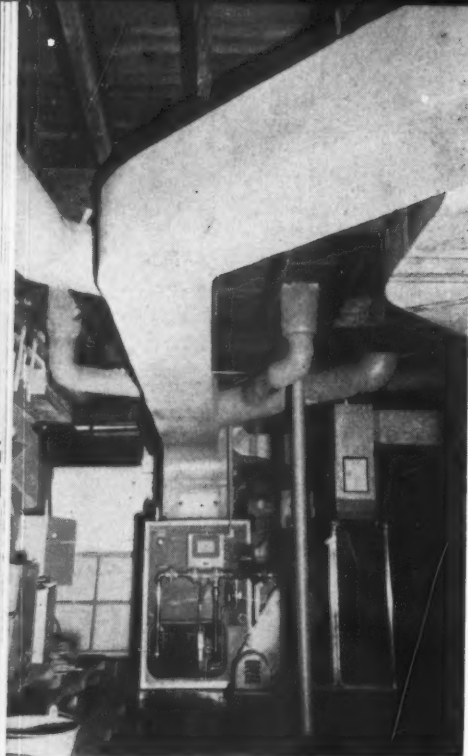
Add to the foregoing complexities such features as building structural obstacles that have to be overcome (meaning offsets and the like); the matter of per hour labor cost, which usually indicates difference between city and suburban regulations; and whether jobs are in multiple or single, isolated installations frequently located many miles apart—and we have some picture of the many variables to be considered in setting up a per opening price.

To use the old wheeze, the man who says "it cannot be done" often is pushed out of the way by the man who goes ahead and does it. Meaning here that, although it is generally held by sheet metal contractors surveyed that air conditioning work cannot be priced on the cost per opening basis, there are many contractors who are using the method and finding it profitable.

"Yes," Says Alfred Stock

A case in point is the Hart Air Conditioning and Engineering Co., Union City, N. J., which firm has installed 175 contracts during the past 1½ years, basing its cost per opening figures all the way from \$13.50 to \$20.00 per opening. Alfred Stock, treasurer of this company, explains that this firm's sheet metal and installation work is being handled by a local sheet metal organization the greater part of whose total business comprises the orders received from the Hart company. Thus, the sheet metal shop is, at least to a degree, controlled by the Hart company.

The Hart company operates in suburban territory, although the sales office is in a city. Where the great bulk of sales are made in city territory all contractors are bound by city regulations as to hourly



wage of mechanics, fire proofing, hours of labor per week allowed, possibly weights of metal used and like restrictions. Thus city work must run higher in cost, as well as in price to the consumer, because of such regulations. Where such restrictions do not apply contractors may, if they wish, work mechanics overtime, in evenings, on Sundays, and can forget the obstacles that city departments place in the way of contractors.

As labor and overhead costs appear to represent about two-thirds of the total cost of air conditioning installations and material costs but one-third, it is easy to see wherein contractors can estimate duct work to be installed, with registers, at from \$13.00 to \$20.00 per opening in 1-family and bungalow contracts such as comprise the activities of the Hart Air Conditioning Co.

According to Mr. Stock, of this company, the secret of their low prices is in the great volume of orders handled and the large duplication of ducts and registers. To explain, this company always includes both a supply and a return register and duct for all rooms except bathrooms and kitchens. Thus a six-room residence has a total of 10 ducts and registers. On a basis of \$15.00 per opening this means \$150.00 for the installation, except the setting of conditioning apparatus, which is extra.

Higher estimates were tried in the beginning, as high as \$25.00 per opening, but it developed that the total cost per job ran so high that contracts in volume could not be secured. As the Hart conditioning contracts cover new low priced, small homes in real estate developments, with practically all building speculative and sold to the class of builder known for his cost cutting and penny squeezing, duplication of metal parts made possible the low prices mentioned.

"No," Says M. Feiner

In contrast to the foregoing conditions is the situation of another large city sheet metal contractor who makes ducts and other sheet metal fittings for air conditioning exclusively and handles some 200 contracts monthly the year 'round. This is P. Feiner & Sons, of New York City, operating a modern, clean and busy shop employing some 25 shop

mechanics in addition to five estimators, or salesmen. According to Mark Feiner, of this company, no attempt is made to regard seriously the price per opening method in air conditioning fabrication.

Interesting is Mr. Feiner's statement that small pieces are relatively as costly to build as large ones from a labor standpoint, although when such pieces as boots for grilles exceed 36 inches in maximum dimension two men have to work on such pieces instead of a single man, the labor cost thus being doubled.

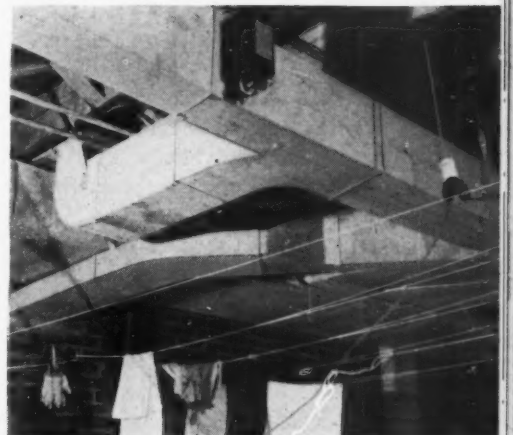
Shop Procedure

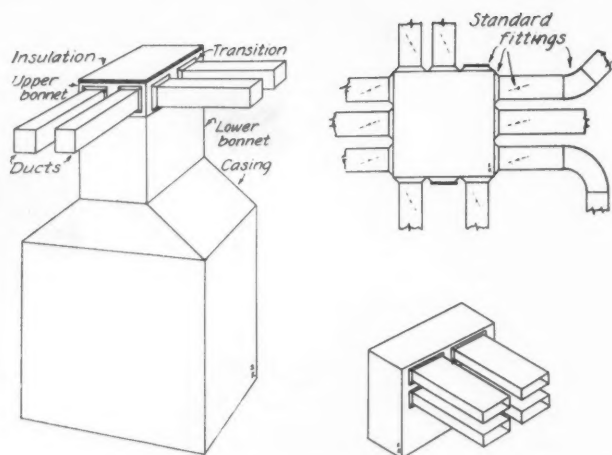
This contractor scales all plans for metal poundage, and if no plans are available the contractor's draftsman is sent out to take data from which shop drawings can be made in the shop. Then all sheet metal ducts, boots, connection pieces, junction pieces, etc., are scaled and recorded and the job turned over to the shop for fabrication.

From experience the Feiner people know that making a duct, say, 20 in. by 30 in. costs so much per foot and full elbows of this size cost so much each to make. Labor costs on complicated pieces are estimated with a 25 per cent margin of safety. When the shop foreman delegates one or more men to make up ducts and fittings on contracts, workmen are given a time, or labor, and material card for every job. The mechanic then places the card in the time clock as to starting time and again in the same clock when the job is done. If two men work on the same job there are two cards on this job, each job having been assigned a number. The man who goes to the stock room for materials jots down in pencil on the card what materials are used. The cards, after the work is done, reach the office, where cost is figured against the contract price, unless the work

(Continued on page 143)

A few examples of "metal work outside any standard unit price." Top—some remodeling takes a lot of metal. Second—cutting and fitting to get through old framing. Third—Ducts to the left; ducts to the right—in a large house. Fourth—Just a little "trick" or two from a remodeled job. Bottom—standardized—yes, but easy to go wrong on if mechanics are sloppy.





An individual duct system showing bonnet takeoffs and either square pipe or wall stack.

THESE discussions of some of the different methods of designing duct systems are for the purpose of presenting the essential details of each and to compare their respective advantages and disadvantages. No attempt has been made to "recommend" any one method in preference to another. A study of these various methods should indicate those which may be considered as suitable for a given type of installation.

In the preceding issue, the procedure to be used in the design of two types of duct systems was discussed in detail. The first method was designated as the:

A. Velocity method

1. Individual duct system

a. Non-standardized ducts.

The duct system determined by this method is characterized by the fact that each duct is separately attached to a single register, and by the fact that the air velocities are predetermined and the duct sizes are based on these velocities alone. A complete discussion of the advantages and disadvantages was presented.

The second method was designated as the:

A. Velocity method

1. Individual duct system

b. Equal total pressures.

This method is a modification of that designated as A-1-a and attempts to equalize the pressure loss in each of the individual ducts, by making the pressure loss in each duct equivalent to that which is greatest in magnitude. This results in more economical usage of the material required for duct construction. Typical differences in the results obtained with the two methods of designing individual ducts were presented. In this issue another modification of the velocity method is considered.

Procedure in Design for:

A. Velocity method

1. Individual duct system

c. Standardized ducts.

This method of designing an individual duct system is one that offers great possibilities and is one that should receive the careful considerations of all designers. This method is a simplification of those discussed previously, and is particularly adapted to the design of duct systems for small, compact houses and buildings. In order to show the method more clearly the follow-

Design For A Forced Air Heating System With Individual Ducts

By S. Konzo

Special Research Associate
Engineering Experiment Station
University of Illinois

ing outline of procedure is presented:

(1) It is assumed that four rooms, indicated by *a*, *b*, *c*, and *d* in Fig. 1, are to be supplied by warm air from the furnace *F*. The method of determining the air volumes required for each room has been discussed in a previous article and hence will not be presented in this one. It is assumed that the air volume requirements for rooms *a*, *b*, *c*, and *d* are 200, 400, 150, and 300 cubic feet per minute, respectively. These values are listed in column (2) of Table 1.

(2) Furthermore, in this example it is assumed that the standardized duct to be considered is a square duct whose dimensions are 7 in. \times 7 in. This standardized duct is to be used in every case, even though in some cases it may be slightly oversized for the requirements. Obviously the air volume capacity of the given duct is limited only by the restrictions placed on the maximum allowable air velocities, or by the maximum allowable friction pressure. For example, the air volume capacity of a 7 in. \times 7 in. duct may be as large as 408 cfm if an average duct velocity of 1200 ft. per min. is allowed. However, the use of extremely high air velocities is accompanied by large pressure losses as well as by air noises. In addition some difficulty may be experienced in reducing the air velocity at the register face. Hence, the air volume capacity

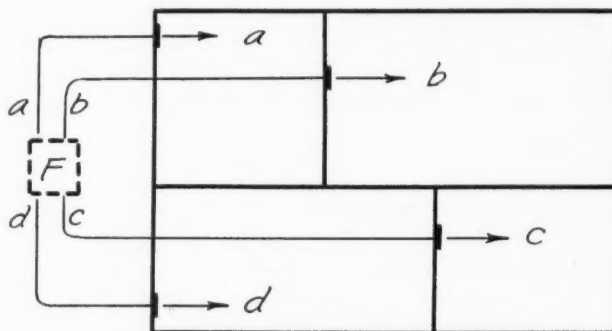


Fig. 1—Simplified line diagram showing an individual duct system. (See text for method of calculating duct sizes.)

TABLE 1
Typical Example of Calculation Procedure

A. Velocity Method			1. Individual Ducts			c. Standardized Sizes		
1	2	3	4	5	6	7	8	9
Room	C.f.m.	Use 7×7 Ducts* Number	Aver. C.f.m. in each duct	Approx. Velocity in each duct	Friction Loss per 100 ft. in inches	Equiv. Length, ft.	Total Friction Loss, in.	Extra Friction by Dampers, in.
a	200	1	200	600	0.13	20	0.026	0.026
b	400	2	200	600	0.13	40	0.052	0.0
c	150	1	150	450	0.08	50	0.040	0.012
d	300	2	150	450	0.08	20	0.016	0.036

*Examples in this table are based on the use of standardized square ducts, 7in. x7 in. in dimension. Maximum allowable duct velocity of 600 ft. per min. used.

of the given duct will be limited to some extent by the maximum allowable air velocities to be used.

In ordinary residential installations it is common practice to limit the maximum air velocity to a value of approximately 750 ft. per min. In fact, a maximum value of 600 ft. per min. is frequently used. If the value of the maximum allowable air velocity is specified, then the maximum value of the air volume capacity of the given duct is likewise specified. For instance, in the case of the 7 in. × 7 in. duct if the air velocity is not to exceed 600 ft. per min., then the air volume capacity is also limited to a value not to exceed approximately 204 cfm.

Resistance, Velocity, Volume

In the typical example it has been assumed that the air velocity is not to exceed 600 ft. per min. and the air volume capacity of the standardized duct is not to exceed 204 cfm. (See values in Table 2 listed under columns 1 and 3). By referring to column 2 in Table 1 it may be noted that in order to handle the air

volumes required, the number of ducts required for rooms *a*, *b*, *c*, and *d* will be 1, 2, 1, and 2, respectively. The actual air volumes to be handled by each duct are listed in column 4 in Table 1.

3. For convenience in making the calculations required, the capacities and friction losses of the 7 in. × 7 in. duct are tabulated in Table 2. It may be noted that for a duct passing approximately 200 cfm. of air the average duct velocity will be approximately 600 ft. per min. and the friction loss for 100 ft. of duct will be approximately 0.13 in. Similarly, for a duct passing approximately 150 cfm. of air, the average duct velocity will be 450 ft. per min. and the friction loss for 100 ft. of duct will be 0.08 in.

For the typical example the values shown in Table 2 were used and these have been listed in columns 5 and 6 of Table 1.

(4) The equivalent lengths of the ducts leading to the four rooms are shown in Table 1, column 7.

(5) The total friction loss in each duct is obtained by substituting proper values in the equation:

$$\text{Total friction loss in inches} = \frac{\text{Equiv. length}}{100} \left(\text{Friction loss per 100 ft.} \right)$$

(6) It may be noted from the values shown in column 8 of Table 1 that the greatest friction loss was obtained in the case of the two 7 in. × 7 in. ducts leading to room *b*. Each of the two ducts had a total loss amounting to 0.052 in., whereas the ducts leading to the other three rooms had somewhat smaller resistances. Obviously, some additional resistance is necessary in all of the ducts, except those two which lead to room *b*, if proper distribution of air is to be obtained. In other words, the dampers in the ducts leading to rooms *a*, *c*, and *d* will have to be adjusted so that the total resistances in those ducts will equal 0.052 in. The extra friction that will have to be imposed by the dampers will be 0.026 in., 0.012 in., and 0.036 in. for the ducts leading to rooms *a*, *c*, and *d*, respectively.

If this adjustment in the dampers is made there is some assurance that the actual duct velocities will be of the order of magnitude shown in column 5 of Table 1.

The selection of the fan for the given installation, requires a determination, among other things, of the total friction loss of the duct system. In this case the total friction loss to be used, is the maximum value as determined in column 8 of Table 1.

TABLE 2

Capacity and Friction Loss of 7 in. x 7 in. duct

Duct area = 49 sq. in. = 0.340 sq. ft.
Equivalent diameter = 7.6 in.

1	2	3
Velocity ft. per min.	Friction Loss per 100 ft., in.	Air vol. handled cu. ft. per min.
100	0.01	34
200	0.02	68
300	0.04	102
350	0.05	119
400	0.06	136
450	0.08	153
500	0.09	170
550	0.11	187
600	0.13	204
650	0.15	221
700	0.18	238
750	0.20	255
800	0.23	272
850	0.25	289
900	0.28	306
950	0.30	323
1000	0.33	340

TABLE 5

Typical Example of Calculation Procedure

A. Velocity Method			1 Individual Ducts			c. Standardized Sizes		
1	2	3	4	5	6	7	8	9
Room	C.f.m.	No. of 3½×12 Ducts*	Aver. C.f.m. in each duct	Approx. Velocity in each duct	Friction Loss per 100 ft. in inches	Equiv. Length, ft.	Friction Loss, in.	Extra Friction by Dampers, in.
a	200	1	200	700	0.24	20	0.048	0.048
b	400	2	200	700	0.24	40	0.096	0.0
c	150	1	150	500	0.13	50	0.065	0.031
d	300	2	150	500	0.13	20	0.026	0.070

*Examples in this table are based on the use of standardized rectangular ducts, 3½ in. x 12 in. in dimension. Maximum allowable duct velocity of 700 ft. per min. used.

It may be noted from the preceding example that the calculation procedure is direct and fairly simple. Furthermore, after the calculations have been completed, the designer has determined numerical values for the air volume, the air velocity, and the pressure loss for each duct in the system.

Advantages of Method A-1-c

The advantages of this method of design may be itemized as follows:

(1) The method of design and the actual installation of the duct system are both characterized by simplicity.

(2) The method lends itself to standardization in duct sizes, bonnet sizes, and installation procedure. In the case of 7 in. × 7 in. ducts, for example, the ducts can be fabricated in commercial lengths on a production basis and can be easily assembled on the job. Standard fittings can be used for all 45-deg. elbows, 90-deg. elbows, and trunk take-off transitions. In fact in some cases, standardized bonnet sections can be made for the use of 8, or 12 pipes. The standardization can be carried to the point of making standard sized dampers, pipe supports, duct insulation, caps for bonnet openings, and labels for the ducts. In fact, the extent to which any individual company or installer may wish to proceed with such standardized methods will be dependent entirely upon the policy of the engineering staff and upon the economic considerations involved.

(3) The method is particularly adapted to smaller installations in which the warm air pipes are short. The method is better adapted also to those installations in which the furnace is located near the center of the house.

(4) The ducts can be designed for a definite maximum velocity or for a maximum carrying capacity.

(5) It is possible by grouping the individual ducts and by running them parallel to each other to present a workmanlike, compact, and neat installation.

(6) The balancing of the ducts and the regulation of the air flow is relatively simple if a cross damper is placed in each duct.

Disadvantages of Method A-1-c

The disadvantages of this method of design may be summarized as follows:

(1) In all of the ducts, except that which has the

greatest pressure loss, the ducts will be slightly oversized, and hence the material in the duct will not be used with the greatest economy. The cost of the material used in the duct is sacrificed for the sake of cheaper installational costs.

(2) This method is not adapted to large installations, in which a large number of registers are served from the furnace. Nor is the method adapted to those installations in which the air requirements for each room are very large. For example, if 600 cfm. is required for a single room, three individual ducts, each 7 in. × 7 in. would be required instead of one larger duct. Also, the method is not suitable for installations having many long ducts.

(3) The heat loss from the duct to the surrounding air will, for a given quantity of air delivered at the registers, be greater for the individual duct system than for the trunk duct system.

Low cfm

(4) For extremely small air quantities, the air velocity in the duct may be exceedingly low, and may be accompanied by extremely low register air velocities. For example, in the case of a 7 in. × 7 in. duct handling 50 cfm. the air velocity in the duct is 150 ft. per min. If the cross sectional area of the register is approximately equal to the duct area, the air velocity at the outlet of the register will be 150 ft. per minute. Some installers prefer to maintain a register velocity equal to at least 250 or 300 ft. per minute in order to prevent the air from ascending directly to the ceiling. If it is desired, the register size can be arbitrarily chosen for a minimum air velocity so that the conditions described will not be obtained.

Balancing System

(5) Since the balancing of the system is dependent largely upon the use of dampers, they should be regarded as a major item in the system. The dampers should be substantial in construction and should be free from disagreeable rattles and vibrations. In some cases the dampers will almost completely throttle the duct in order to introduce enough resistance in the given duct. It is advisable to locate the dampers close to the bonnet, not only so that they will be easily accessible, but so that any air noise created at the dampers will be absorbed to some extent in the duct.

(Continued on page 146)

WATERBURY COMFORTROL

AIR CONDITIONER

Controlled Winter Comfort
Complete Heating and Winter Air
Conditioning for the Home.



The SENSATION at Last Year's ShowTHE SUCCESS of the Past Season!

AT the Heating and Ventilating Exposition last January, dealers and heating engineers predicted a spectacular success for the New WATERBURY COMFORTROL Air Conditioner. Their predictions were fulfilled in the hundreds of new dealer connections throughout the nation and in overwhelming retail sales volume during 1936.

Why? Because the WATERBURY COMFORTROL is a completely coordinated warm-air heating and winter air-conditioning unit . . . engineered specifically for oil heat . . . embracing advanced features far ahead of its field . . . and offering thrilling new beauty of design and finish as yet unmatched in the industry.

Over a quarter century of experience in building **quality** warm air furnaces . . . of pioneering in the efficient development of the welded seamless steel furnace body . . . a national reputation for leadership in modern construction . . . is back of WATERBURY

COMFORTROL. Any oil burner will give more efficient, more economical, more satisfying service in a WATERBURY COMFORTROL . . . will give "what it takes" to build customer good will, enviable reputation and increased business for you! Four sizes from which to choose . . . a correct size, equipped with the right blower, for almost any job. Summer cooling equipment may be easily added.

FREE Engineering Service—blue-prints, data sheets and estimates of required materials that your mechanics can easily follow, furnished for any Waterbury job without charge.

A complete line of warm air furnaces for any fuel and to meet all home-heating requirements . . . including the WATERBURY SEAMLESS and, to meet price competition, the WATERBURY GASTITE.

Nationally Advertised in American Home, Time, etc. As a profit-maker and business-builder WATERBURY challenges your comparison with the field. Write for catalog and dealer proposition.

WATERLOO

Air Conditioning REGISTERS

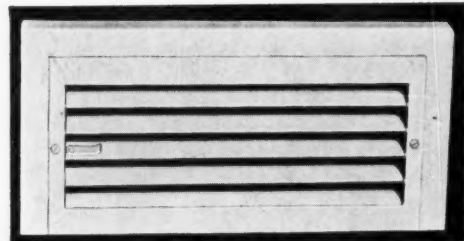
Brilliant advanced styling, straight-line simplicity, sparkling beauty—set Waterloo Air Conditioning Registers apart from all others.

Slanted louvres reflect light and color, conceal the ducts—provide a smart, modern "Venetian blind effect."

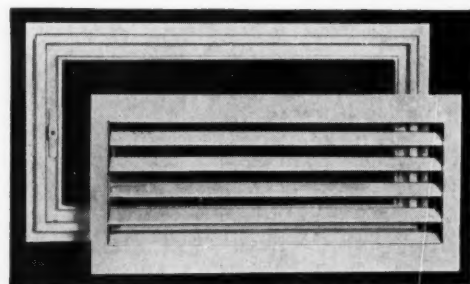
Complete adjustable control of air flow (90-degree range), positive lock mechanism, and tested capacities—these are additional exclusive advantages of Waterloo's original "registers of tomorrow."

Get our complete catalog, with new designs, new charts and full installation data.

Write for a Free copy—today.



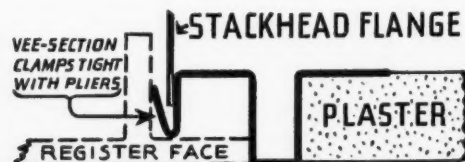
FHD-204—Two-piece Venetian type adjustable register for baseboards.



FH-102—Venetian Type adjustable register for walls, with Vee-U plaster frame.



FH-100—Adjustable one-piece Venetian Type Register for walls.



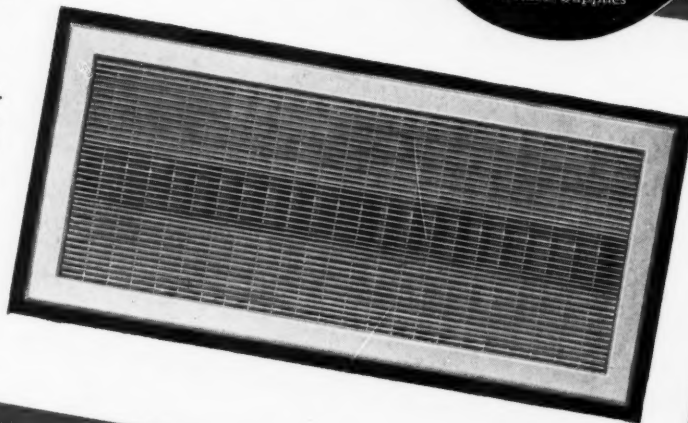
The Waterloo Vee-U Frame assures positive, tight connection with stack-head.

REGISTERS FOR EVERY NEED

Floor Registers
Floor Cold Air Faces
Baseboard Gravity Registers
Wall Registers
Oakwood Faces
Steel Grilles
Furnace Supplies

Air-Master GRILLES

Latest achievement of Waterloo engineers. New, modern straight-line design gives greater free area. Fine bars of varied angle settings spread or control air flow, increase diffusion of incoming air with room air. Supporting bars are adjustable to deflect air up and down, or left and right. See our new catalogue.



WATERLOO REGISTER COMPANY
Waterloo, Iowa
Seattle, Wash.

IN NEW YORK CITY—Air Conditioning Utilities, Inc., 8 W. 40th Street
IN LOS ANGELES, CAL.—Waterloo Register Company, 824 Clanton Street

A Time Saving Method For Figuring Heat Loss

By E. A. Bailey
General Electric Co.

MANY a sales engineer for heating equipment has struggled laboriously through a detail heat loss calculation for a home and wished for a shorter and easier method of estimation. A short method which would take only a few minutes and yet would be accurate within 10% or 15% of the actual loss would save hours of time for the sales engineer or estimator and might possibly be as accurate as the detail method in the long run because of the greater chance for arithmetical errors in the tedious detail calculations when performed hurriedly.

A successful short method introduced by a large manufacturer of automatic heating equipment early in 1934 has been further simplified as a result of continued use and study. Now, a heat loss survey of a home can generally be completed in less than 15 minutes and will usually be within 10% of the heat loss determined by detail calculations carefully made. This short method of calculating heat loss enables a sales engineer or estimator to select the proper size of heating equipment in a few minutes, on the spot, without taking the house plans home for an evening's session. This means more quotations per day and more orders. Another use of the short method is for checking total radiation installed. Also, it is a close check on a detail room by room survey for the design of the heating system after the job is sold.

The Detail Method

The detail heat loss calculation may be made for the house as a whole or for each of the individual rooms. For a quotation on heating equipment the overall or

"box" method is usually sufficient. In the "box" method the total wall, roof-ceiling, window and door and exposed floor areas are calculated for the transmission losses. Generally the crackage at windows and doors is calculated for the infiltration loss, but sometimes the infiltration loss is calculated on the basis of an assumed number of air changes per hour. Of course, the crackage method is the most accurate. In this article it is assumed that the reader is familiar with the conventional detail method of calculating heat loss, but the method is summarized briefly in the following paragraphs.

The transmission loss is obtained by multiplying the number of square feet of each kind of area by its coefficient in B.t.u. per hr. per sq. ft. per degree and by the number of degrees temperature difference for design. Thus, for ordinary frame construction the wall coefficient is .26 B.t.u. per hr. per sq. ft. per degree. Then, if the total wall area is 1,000 sq. ft. and the outside design temperature is 0 degrees, the wall transmission loss is $1,000 \times .26 \times (70-0) = 18,200$ B.t.u. per hr. The losses through the other surfaces can be found in the same way.

The infiltration loss is the loss due to the warming of the outdoor air which comes into the house primarily through cracks around windows and doors. This loss is, of course, greater for high wind velocities. The American Society of Heating and Ventilating Engineers has made tests on the amount of air which comes in per foot of crack for various kinds of cracks and for various wind velocities. In calculating the infiltration loss only half the total crack is usually used because it is assumed that air comes in through half the crack-

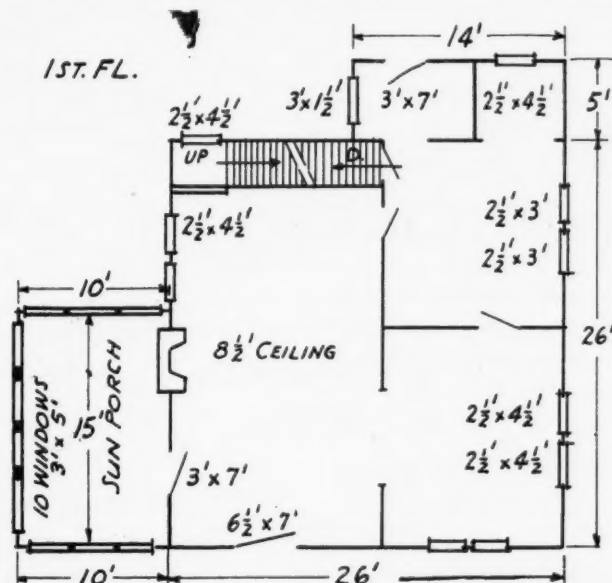


Fig. 2—First and second floor plans of house used as example to show procedure in applying this suggested calculating sheet.

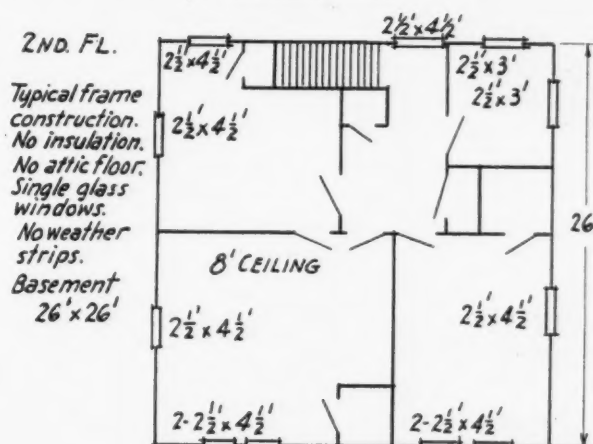


TABLE 1

Type of Home	COEFFICIENT MULTIPLIER		
	Wall	Roof	Window
1 story	.110	.150	.027
1½ story	.100	.100	.027
2 story	.100	.083	.027
2½ story	.100	.065	.025
3 story	.085	.062	.023
4-5 story	.070	.040	.020

TABLE 2

WALL COEFFICIENTS:

Frame walls: Exterior; clapboards, shingles, or brick veneer and sheathing. 2 in. by 4 in. studding. Interior; lath and plaster, or plaster board and plaster.

No insulation	.26
½-in. flexible insulation or 1 in. rigid insulation	.16
Cellular Gypsum fill	.11
Flaked Gypsum fill	.10
Rock wool fill	.07

	8 in. Thick	12 in. Thick
Plain Brick Walls, no interior finish	.50	.36
With ½ in. plaster on brick	.46	.34
With ½ in. plaster on wood lath	.30	.24
Brick Veneer on hollow tile walls:		
No interior finish	—	.34
With ½ in. plaster on tile	—	.33
With ½ in. plaster on wood lath	—	.24

Stone Walls—no exterior finish:		
Plain walls, no interior finish	.71	.58
With ½ in. plaster on stone	.64	.53
With ½ in. plaster on wood lath	.37	.33

Hollow Concrete Blocks—no ext. finish:		
Plain walls, no interior finish	.56	.49
With ½ in. plaster on walls	.52	.46
With ½ in. plaster on wood lath	.32	.30

TABLE 4

WINDOW AND INFILTRATION COEFFICIENTS

Single windows, no weatherstrips	1.65
Single windows, weatherstrips	1.45
Storm windows, no weatherstrips	.85
Storm windows, weatherstrips	.60
Steel sash casement windows	1.65

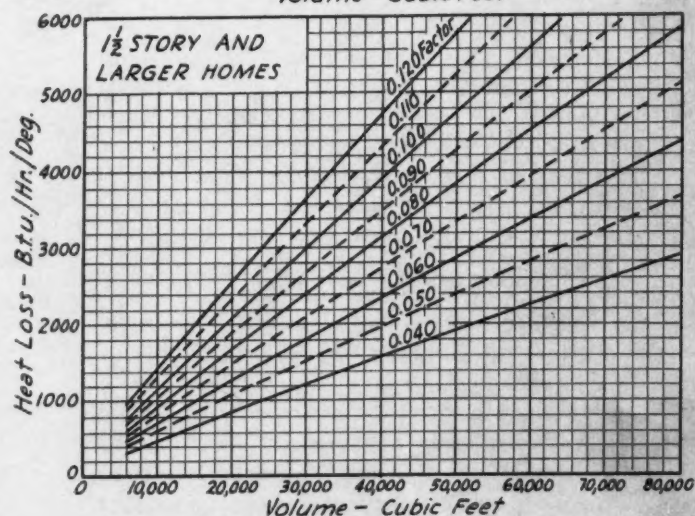
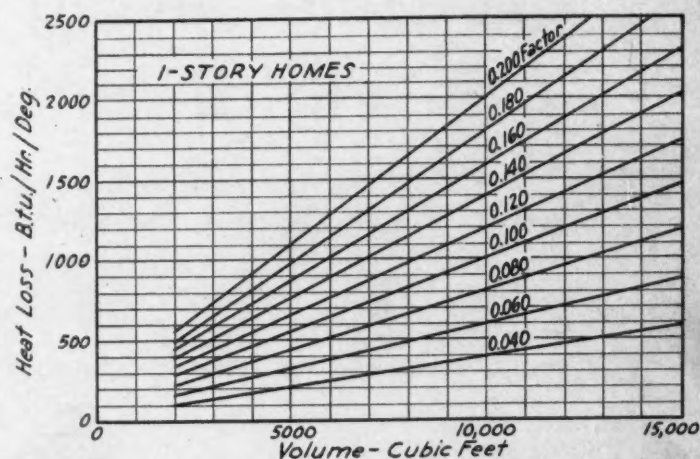


TABLE 3

Roof Coefficients
Exterior: Shingles, Tile or Slate on Wood Sheathing. Ceiling (below attic floor) plaster on lath or plaster board

Interior covering of rafters	NO ATTIC FLOOR			1-IN. ATTIC FLOOR		
	None	Lath and Plaster	½-in. Insulation	None	Lath and Plaster	½-in. Insulation
No insulation between floor joists	.24	.19	.16	.16	.14	.12
½-in. flexible insulation between floor joists	.14	.13	.11	.11	.10	.093
2-in. loose insulation between floor joists	.11	.095	.087	.089	.081	.075

Limitations of Short Form Heat Loss Method

PURPOSE OF METHOD: The short form method is intended primarily for the use of sales engineers in making up quoting prices on equipment. It should not be used for the design of a heating system after the order is obtained.

ACCURACY: Usually within 10% of the result given by a detail calculation if the window does not vary more than 15% from average.

BOILER LOAD WITH STEAM SYSTEM: Installed radiation determines boiler load.

COMMON WALLS: Not more than 5% of wall area can be common to another building.

UNEXCAVATED FLOORS: If more than 30% of total floor area is over space which is not heated to at least 50 degrees by losses from heating plant or otherwise, the heat loss from such floor area must be estimated and added to the result obtained by the short form.

SHORT FORM HEAT LOSS SURVEY

Dealer:

Date 4-21-36Made by E.A.B.Name John JonesAddress 1 Bond PlaceNo. Stories 2Sun Porch (yes or no) YesWall Construction Frame with studs - no insulationRoof and Ceiling Construction No attic floor - no insulationWindow Construction Single windows - double hung - no w.s.

Heated Volume 13,004 Cu. Ft. (Include all space heated directly or indirectly to design indoor temperature. Include half of basement volume, if heated to design temperature. Otherwise, neglect basement.)

This space for calculating volume, if necessary: *Basement not included. Is heated by losses from boiler and piping to approx. 60°*

Main house - $26 \times 26 \times 16\frac{1}{2} = 11,154$
 Rear "L" - $5 \times 14 \times 8\frac{1}{2} = 575$
 Sun Porch - $10 \times 15 \times 8\frac{1}{2} = 1,275$
13,004

Calculation of Factor:

	Heat Loss Coefficient		Coefficient Multiplier		Factor
Wall:	<u>.26</u>	X	<u>.1</u>	=	<u>.026</u>
Roof:	<u>.24</u>	X	<u>.083</u>	=	<u>.02</u>
Window:	<u>1.65</u>	X	<u>.027</u>	=	<u>.045</u>
Total Factor =					<u>.091</u>
Add 5% if house has sun porch (or porches) =					<u>.005</u>
Add 5% exposure factor for wind above 15 mph =					<u>.005</u>
Overall Factor =					<u>.101</u>

Heat loss (BTU/hr/deg.) 13,004 X (Degrees) 70 = 91,910 BTU/hr.

Remarks:

Fig. 1—The data sheet above is actually 9 by 12 inches. The example residence is calculated and filled in as shown. The text explains just how to make the calculations.

age and goes out through the other half after being warmed to the inside design temperature. The infiltration is given in cu. ft. of air per hour per ft. of crack. Taking the density of air as .075 lb. per cu. ft. and the specific heat as .24 B.t.u. per lb. per degree, the infiltration loss = cu. ft. per hr. \times .075 \times .24 \times temperature rise. Thus, if the total crackage is 400 ft. and the infiltration is 30 cu. ft. per hr. per ft. of crack, the infiltration loss is

$$\frac{400}{2} \times 30 \times .075 \times .24 \times (70-0) = 7,560 \text{ B.t.u. per hr.}$$

The transmission coefficients and the infiltration losses are usually based on 15 mile per hour winds. If the wind velocity during the coldest weather is higher than this, it is necessary to allow for it in calculating the maximum heat loss. Usually, 5% to 10% is added to the total loss for the increased windage.

The Short Form

The short form outlines a method for calculating heat loss exactly like the detail method described above except that it is not necessary to calculate the various areas and the crackage.

The areas are expressed in ratios of area to heated volume for various types of houses. These ratios are shown as coefficient multipliers in Table 1 on the

back of the form. It is possible to calculate the wall loss, for example, by multiplying the wall transmission coefficient by the coefficient multiplier, the heated volume and the number of degrees temperature difference. However, on the form, each coefficient is multiplied by its multiplier to obtain a factor. The sum of the factors multiplied by the heated volume and the number of degrees temperature difference gives approximately the total heat loss. For convenience, transmission coefficients are given on the back of the form for the usual forms of construction. Roof coefficients are per sq. ft. of ceiling area and are overall coefficients including the ceiling or the walls of rooms in the attic and the roof. For forms of construction not shown on the form the coefficient may be estimated or obtained from any good handbook. Where there are several kinds of construction in one house, the coefficient used should be a weighted average of the respective coefficients.

Windows, Doors, Floors

The crackage and transmission losses for windows and doors have been combined on a sq. ft. of window basis and are shown as "window and infiltration coefficients" on the back of the form in Table 4. These coefficients were calculated for an average $2\frac{1}{2}$ by 5-foot window. The area per window was approximated at 12 sq. ft. and the crackage at 17 feet. Since it is assumed that air comes in through only half of the total crackage for the house, only 8.5 feet of crack was used in calculating the combination coefficients. Thus, for every sq. ft. of window area .71 ft. of crack was used. Outside door area was considered same as window area because of the very similar construction.

Transmission coefficients for windows were taken as 1.13 for single glass and .45 for double glass (storm windows or double glazing). Infiltration was based on tables in the 1936 A.S.H.V.E. Guide and for a 15-mile per hour wind was taken as follows:

	Cu. ft. per hr. per ft. of crack
Single windows, no weatherstrips.....	39.3
Single windows, weatherstrips.....	23.6
Storm windows, no weatherstrips.....	30.0
Storm windows, weatherstrips.....	12.0
Steel sash casement windows.....	33.0

Then, for single windows with no weatherstrips the combination window and infiltration coefficient is $1.13 + (.71 \times 39.3 \times .075 \times .24) = 1.65$.

Usually the amount of exposed floor area is negligible and no allowance for floor losses is made on the form. In cases where more than 30% of the total floor area is over space not heated to at least 50 or 60 deg. by losses from the heating system or otherwise, the floor loss can be estimated the same as in a detail calculation and added to the loss obtained by the short method.

To allow for the larger ratio of window area to volume in a house which has a sun porch or porches it is recommended that 5% be added to the overall factor. Also, for wind velocities in excess of 15 miles per hour on the coldest days, about 5% should be added.

The heat loss in B.t.u. per hr. per deg. can be deter-

mined quite closely by multiplying the volume by the overall factor. However, it is recommended that the curves on the back of the form be used because they save multiplication and make allowance for the fact that the ratios of area to volume are larger in small houses than in large ones. These curves and the coefficient multipliers were determined from a study of several hundred houses.

Example

As an example of the simplicity and accuracy of the short form a short calculation, Fig. 1, has been made of the typical two story house shown in Fig. 2. The total heat loss was found to be 91,910 B.t.u. per hr.

In order to make a comparison a detail heat loss calculation was made as follows:

Wall transmis-	
sion coeff. ....	.26 B.t.u. per hr. per sq. ft. per deg.
Window transmis-	
sion coeff.	1.13 B.t.u. per hr. per sq. ft. per deg.
Window infiltra-	
tion coeff. ....	.71 B.t.u. per hr. per ft. per deg.
Ceiling and roof	
coeff. ....	.24 B.t.u. per hr. per sq. ft. per deg.
Floor coeff. ....	.34 B.t.u. per hr. per sq. ft. per deg.

GROSS WALL AREA

$134 \times 8.5 = 1140$	sq. ft. first floor
$104 \times 8 = 832$	sq. ft. second floor
<hr/>	
1972	

GLASS AND DOOR AREA AND CRACKAGE

	Area	Ft. of Crack
10—3 \times 5 ft. windows	150	190
17—2½ \times 4½ ft.	190	280
1—6½ \times 7 ft.	45	20
1—3 \times 7 ft.	21	20
4—2½ \times 3 ft.	30	54
1—3 \times 1½ ft.	5	9
<hr/>		<hr/>
	441	573

Net wall area = 1531	sq. ft.
Glass area = 441	
Ceiling area = 896	
Floor area = 220	
Crackage = 573	ft.

Wall loss = $1531 \times .26 =$	398 B.t.u. per hr. per dg.
Glass = $441 \times 1.13 =$	498
Ceiling = $896 \times .24 =$	215
Floor = $220 \times .34 =$	75
Crackage = $286 \times .71 =$	205

1391

Add 5% for exposure 70

1461 B.t.u. per hr. per dg.

1461×70 deg. temp. diff. = 102,000 B.t.u. per hr.

10 Per Cent Accuracy

It should be noted that the detail method gives a heat loss only about 10% above that by the short form method. This is typical of the accuracy of the short form method. The answer obtained by the short form will usually be within 10% either above or below the answer by an accurate detail method. Errors greater than this are usually caused by unusual ratios of window area to volume. With a little experience such cases can be easily corrected by taking either a larger or a smaller window coefficient multiplier.

Shortened Short Form

It should also be noted that for very rapid calculation of heat loss, it is possible to estimate the overall factor without any calculation. For example, the usual frame construction house with single glass, no insulation and no weatherstrips, will usually have an overall factor of about .1. In other words, the heat loss in B.t.u. per hr. per deg. will usually be about .1 of the heated volume.

Limitations

The heat loss obtained by the short form survey may differ 10% or more from the loss obtained by an accurate detail method, depending on the care and the experience of the estimator.

The heat loss obtained by the short form is the maximum heat loss of the house and usually must be increased somewhat in determining the size of the heating equipment. For warm air or hot water systems a duct loss or pipe loss must be added to allow for basement losses from ducts or pipes. For steam systems the maximum boiler load is determined by the amount of radiation installed and is independent of the heat loss of the house except that the radiation should be installed approximately equal to the maximum heat loss. Also, about 25% "pickup" is usually added to the radiation of a steam system in determining the total boiler load. This "pickup" factor insures that all radiation will be heated quickly and evenly from a cold start.

The actual design of a heating system after an order is obtained should always be based on a detail heat loss calculation.

Author's Note

The author wishes to emphasize that this particular short form of calculating heat loss should not be used by the inexperienced heating man. Not that the method suggested is too complicated or difficult to understand, but because allowances must be made for conditions which only experience can reveal as hazardous to a sensible result from the method. Used intelligently, by contractors with experience, this method should prove advantageous in setting up a quick heat loss, subject to later and more detailed checking.

It might also be emphasized again that the factors used were originally established from dozens and dozens of checks against actual houses, including all materials of construction, architectural styles, shapes and exposures. These factors are, therefore, averages and should be applied as such.

For 1937..



COMFORTMAKER for
stoker operation.

Air Conditioning
operation. Please
complete details and i

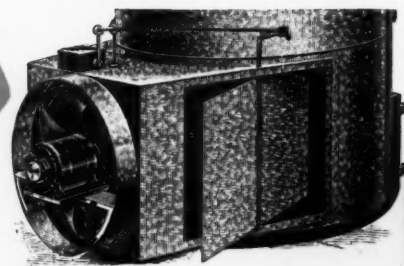
C

omfort MAKER

**Comfort Engineers
MAKER Pioneered**

Forced Air

Forced air was a step in the right direction and overcame the difficulty of getting heat to remote parts of the home, but this system could not be controlled.



COMFORTMAKER Forced Air Unit
1918 to 1924

**Comfort Engineers
MAKER Pioneered**

The Heat Booster

This type of heat booster constitutes the basis for 95 per cent of all air conditioning being sold today. Patents covering this type of booster are owned by the Joliet Heating Corporation, manufacturers of COMFORTMAKER.

This type of air booster lacks control. Air is delivered like a hurricane or it becomes stagnant. While better than hand operated systems, it increases fuel costs as much as 30%.

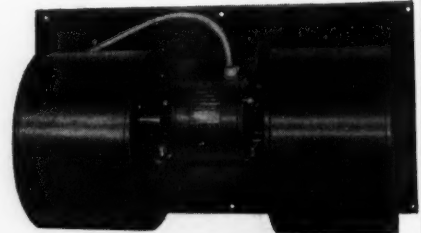


COMFORTMAKER
Booster Unit
1924 to 1931

**Comfort Engineers
MAKER Pioneered**

Mechanical Constant Air Flow

COMFORTMAKER engineers have pioneered all the advances in home air conditioning which has resulted in there being more Two Speed, Varied Fuel COMFORTMAKER Air Conditioning Units in use throughout the United States than all other makes combined. COMFORTMAKER supremacy is based on actual performance of over a 41 year period. COMFORTMAKER air conditioning has led the way, step by step, and has been and is always years ahead.



COMFORTMAKER Eight Speed Blower
with Two-Speed Control
1931 to 1936

COMFORTMAKER products have always had exclusive selling features. That is why COMFORTMAKER dealers lead the parade. They have a clean field—they have no competition. No other dealer can match COMFORTMAKER products, COMFORTMAKER efficiency or COMFORTMAKER prices.

JOLIET

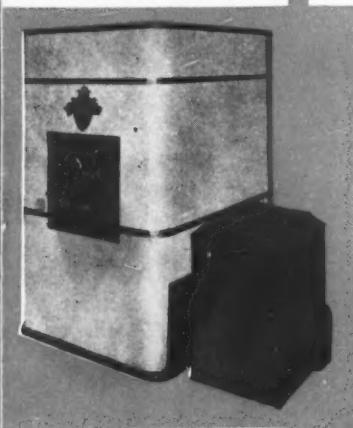
MAKERS OF A
ALL-STEEL FURNACE AND



Deluxe COMFORTMAKER
for coal, oil or gas



COMFORTMAKER for
low cost housing



COMFORTMAKER for
stoker operation

An exclu
Cannot

In 1931—C
acclaimed
COMFORT
inexpensive
diligent, u
and today
TROL. A
ature vary



This trad
condition
CIENCY,
FORT AI

HEA
CO
JOL

COMPLETE
AIR CON

Again Leads the Field

Tie with a Leader for 1937

Comfort
MAKER Engineers
NOW Give You

Precision Air Control

An exclusive control found only on COMFORTMAKER units.
Cannot be obtained on any other make regardless of price.

In 1931—COMFORTMAKER mechanical constant air flow air conditioning was acclaimed the greatest heating achievement in the past decade.

COMFORTMAKER engineers, however, considered it only one step closer to an inexpensive Precision Control of air movement in the home. Four years of diligent, untiring research and grilling breakdown tests, have been rewarded, and today COMFORTMAKER engineers give to the world—PRECISION AIR CONTROL. A Positive Control of air movement in the home with an even temperature varying less than two degree range of the thermostat setting.

Again COMFORTMAKER is years ahead

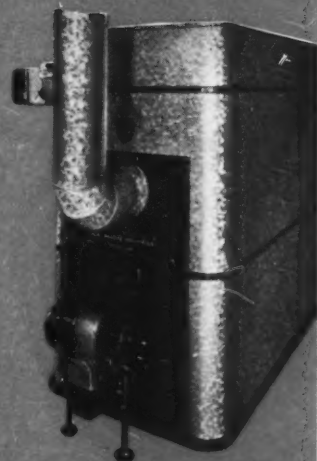


This trademark on an air conditioner means EFFICIENCY, HEALTH, COMFORT AND SAVINGS.

The PRECISION AIR CONTROL is the first control to regulate the blower speed through the room thermostat. AN ACHIEVEMENT NEVER BEFORE ACCOMPLISHED—Immediate action—when the temperature in the room reaches the thermostat setting the blower cuts from high to low speed—thus a constant flow of mildly tempered air is supplied, and temperature is maintained within a two degree range of thermostat setting.

PRECISION AIR CONTROL eliminates expensive zone control—no more stratification—overheating is abolished,—fuel savings up to 30% are guaranteed.

The COMFORTMAKER Precision Air Control Is Years Ahead



COMFORTMAKER designed for gun or pot type oil burner



COMFORT-MAKER Gas Unit



The COMFORTMAKER PRECISION AIR CONTROL is built for the Joliet Heating Corporation by the largest manufacturer of electric controls and accessories in the world. It is of rugged construction with no tubes to break,—it is compact—easy to install—accurate and efficient.

**HEATING
CORPORATION**
JOLIET ILLINOIS

COMPLETE LINE OF
AIR CONDITIONING UNITS

Many exclusive territories are still open for distributors and dealers who are alive, progressive and up and at 'em. Use the coupon for full information.

JOLIET HEATING CORP.
Joliet, Illinois.
Gentlemen:

We are interested in your line of Conditioning Products and Precision Control operation. Please send us without obligation complete details and information.

Name

Address

Season	Type of Cooling Plant	Number of Days With Temperature Above 85°F	Total Degree-Hours Above 85°F Base	Indoor Conditions Maintained			Cooling Capacity of Plant 5 ft. per Hour*	Operating Costs, Cents per Hour**					Total Cost per Ton of Refrigeration Delivered Cents	Cost of Operating Fan for Night Air Cooling Cents per Ton	
				Dry bulb Temp. °F.	Relative Humidity, Per Cent	Effective Temp. °F.		Ice	Water	Circulating Pump	Compressor	Refrigerating Fan			Total
1932.	Ice	62	1470	78.0	45	72.0	30,000	44.00	—	1.55	—	0.82	46.37	18.56	—
1934	Mechanical	65	2660	80.0	45	73.5	29,000	—	3.17	—	9.05	1.05	13.27	5.49	1.27
1935	Water from City Mains	49	1180	80.0	65	75.5	24,000	—	11.88	—	—	1.34	13.22	6.61	1.37

* After Several Hours of Continuous Operation
** Based on the Following Rates—Ice, 4¢ per Ton; Water, 33 Cents per 1000 Gal.; Power, 31 Cents per kWh.

Season	Type of Cooling Plant	Number of Days With Temperature Above 85°F	Total Degree-Hours Above 85°F Base	Operating Conditions				Seasonal Operating Costs in Dollars (Calculated)**						Ratio of Maximum to Minimum Seasonal	Per Cent Reduction in Seasonal Operating Costs	
				Awnings		Circulation of Outdoor Air at Night		Ice	Water	Power for Operating			Total			
				With	Without	With	Without			Circulating Pump	Compressor	Refrigerating Outdoor Air				
1932	Ice	62	1470	Yes	—	—	Yes	16.20	—	8.72	—	4.64	—	174.56	0.675	32.5
				—	Yes	—	Yes	240.00	—	12.20	—	6.47	—	258.67		
1934	Mechanical	65	2660	Yes	—	Yes	—	—	12.89	—	31.87	5.86	12.03	62.65	0.834	16.6
				Yes	—	—	Yes	—	19.10	—	47.23	8.71	—	75.09		
1935	Water from City Mains	49	1180	Yes	—	Yes	—	—	16.83	—	—	10.37	9.71	36.91		

* Assuming that the Plants were Operated the Entire Season Under the Conditions Indicated
** Based on the Following Rates—Ice, 4¢ per Ton; Water, 33 Cents per 1000 Gal.; Power, 31 Cents per kWh.

At top—Table 1—Showing seasonal weather data and operating data for the central cooling plants. Below—Table 2—Showing seasonal operating costs* (calculated) for the central cooling plants.

The Cost of Summer Cooling*

By M. K. Fahnestock,
Research Assistant Professor,
University of Illinois

THE wide variation in the weather during the cooling seasons of 1932, 1934, and 1935, and the difference in the methods of operation and the indoor conditions maintained with the three central cooling plants, makes any comparison of seasonal operating costs very difficult.

In considering operating costs it should be kept in mind that they are directly dependent upon the power, water, and ice rates in the particular community under consideration, as well as upon the type and efficiency of the plant, and, therefore, data secured in one community, as Urbana, Illinois, should, when applied to another community, be adjusted for the variation in the utility rates.

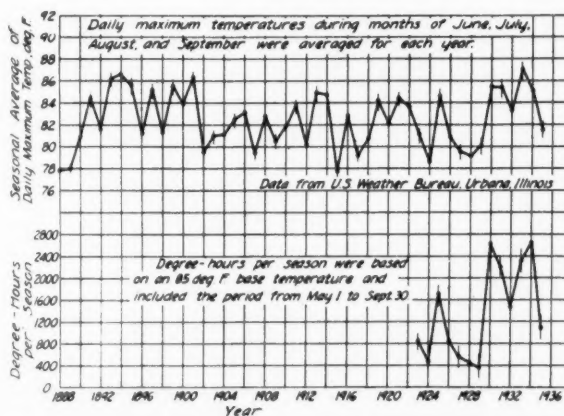
Fig. 13 shows a graphical record of the summer temperatures in Urbana, Illinois, from 1888 to 1935. The daily maximum temperatures during the months of June, July, August, and September, were averaged for each year, and these values constitute the seasonal averages of daily maximum temperature that are shown in the upper curve. The data were secured from the local station of the U. S. Weather Bureau.

The lower curve in Fig. 13 shows the degree-hours per season from 1923 to 1935. The degree-hours per season were based on an 85° F. base temperature and included the five months of May, June, July, August, and September, and from these data it may be observed that the degree-hours for the seasons of 1932, 1934, and 1935 were 1470, 2660, and 1180 respectively. The degree hours for the season of 1933, which was devoted to numerous incidental tests involving cooling with different methods of circulating outdoor air at night, the

operation of the central cooling plant with limited amounts of ice and tests with the unit room coolers, were 2310. Thus, it is obvious that seasonal operating costs cannot be compared directly, due to the great variation in the severity of the seasons.

Furthermore, the data indicate the futility of attempting to predict or estimate the severity of any approaching season from a knowledge of the preceding ones. During the twelve-year period from 1923 to 1935, the mean number of degree-hours per season was 1350, the minimum during any season was 360 degree-hours, and the maximum was 2660 degree-hours. Using the number of degree-hours per season as a legitimate measure

(Continued on page 158)



GRAPHICAL RECORD OF SUMMER TEMPERATURES IN URBANA, ILLINOIS FROM 1888 TO 1935.

Fig. 13—The degree hours of cooling per season for 1923 to 1935 based on an 85-degree base temperature and including the months of May, June, July, August, September.

*Excerpt from a paper "Research in Summer Cooling at the University of Illinois," delivered at the Conference on Air Conditioning in Urbana, May 4 and 5, 1936.

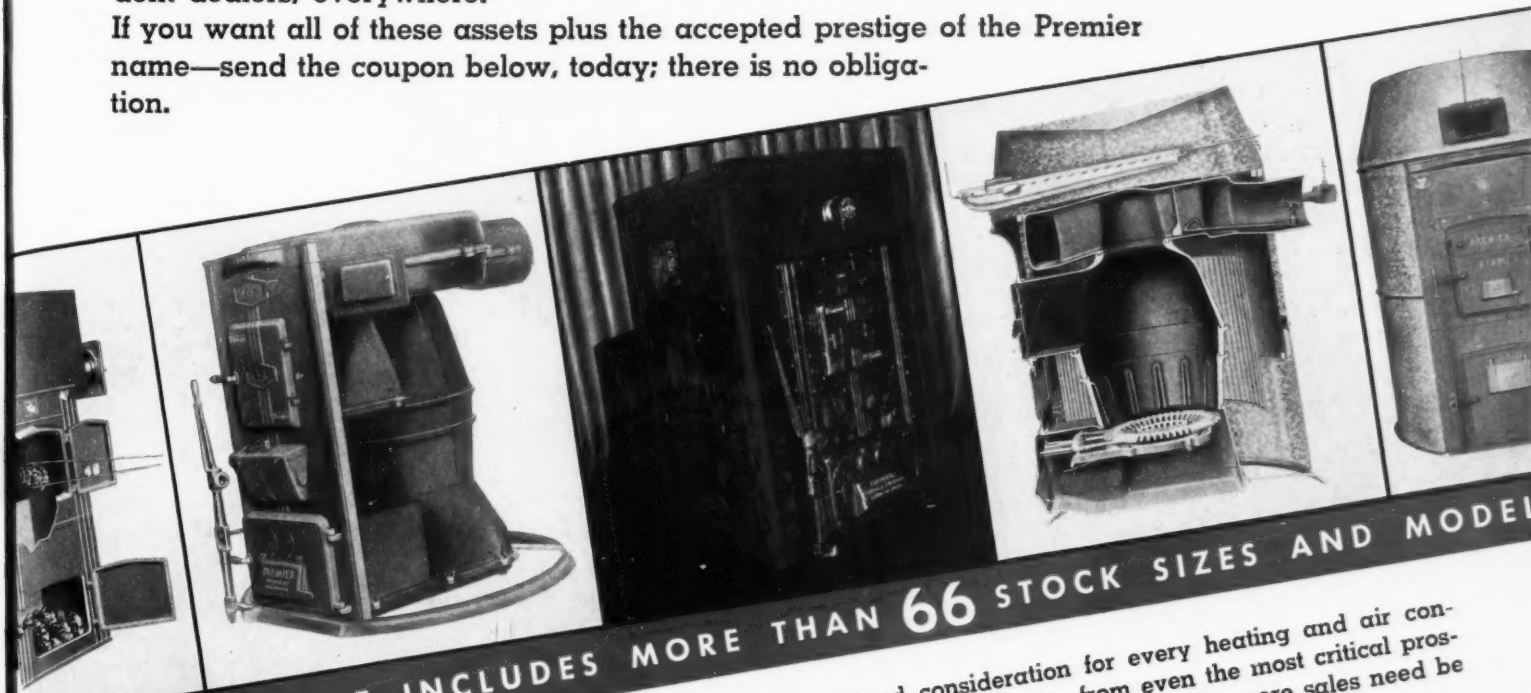


Start the Year Right.

with PREMIER

WRITE today for Premier's new Dealer Proposition—it will be your first step toward making 1937 a banner year. Premier Dealers are given definite territory protection . . . they receive a full measure of factory co-operation which includes engineering, sales and advertising helps . . . they enjoy an exclusive dealership for Premier's complete line of heating and air conditioning equipment—a line that is the favorite profit maker of hundreds of independent dealers, everywhere.

If you want all of these assets plus the accepted prestige of the Premier name—send the coupon below, today; there is no obligation.



THE PREMIER LINE INCLUDES MORE THAN 66 STOCK SIZES AND MODELS

With the big and varied Premier Line you will be able to command consideration for every heating and air conditioning job in your community. With more than 66 models and sizes to choose from even the most critical prospect is bound to find a Premier Product that is exactly suited to his needs and pocketbook. No more sales need be lost just because the line you feature does not include the particular unit demanded by your customer. Premier's Line includes steel and cast furnaces for gravity installations . . . specially designed steel air conditioners for oil, gas and stoker . . . moderately priced "package" units for hand firing . . . "add-on" blowers, in many sizes, with deliveries up to 8500 C.F.M. . . air washers . . . home coolers . . . oil burners . . . accessories and controls . . . everything for every job—from a single source of supply.

Line up with Premier for 1937 and go to town at the head of the parade. We'll help you sell . . . we'll help you engineer "tailor-made" installations for your prospects . . . and, we will help you to a generous share of the heating and air conditioning profits in your territory.

As a suggestion; when sending the coupon, indicate your home address and the Premier Portfolio will be sent there, where you may consider the Premier Proposition at your leisure, in the quiet of your own home.



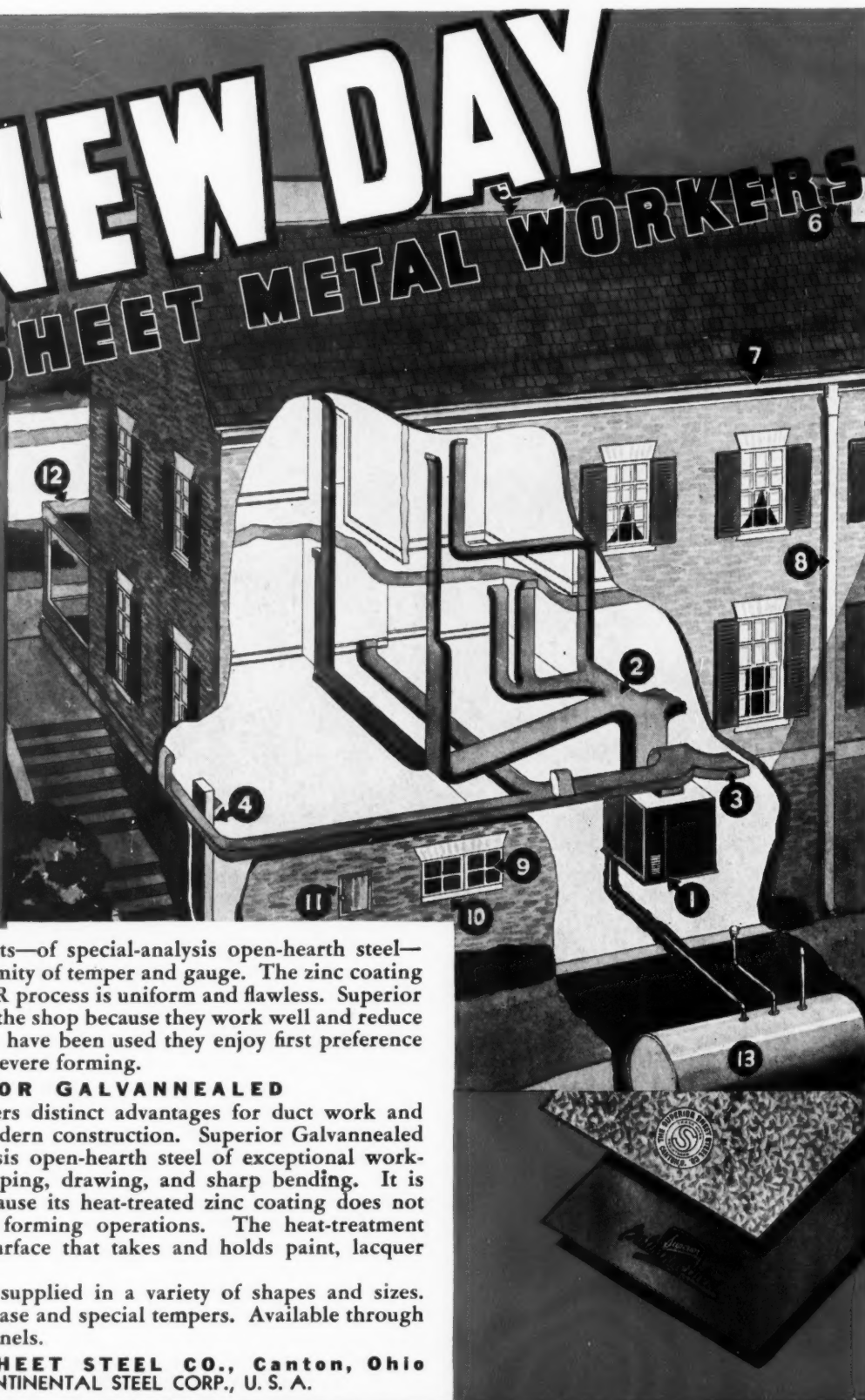
PREMIER FURNACE COMPANY
Manufacturers of Warm Air Heating and Air Conditioning Equipment
★ DOWAGIAC MICHIGAN ★

MAIL THIS COUPON NOW!

Premier of Dowagiac,
Gentlemen:
I'm interested—send me the Premier Proposition for 1937. There is no obligation, of course.
FIRM NAME
BY
ADDRESS STATE
CITY
HOME ADDRESS
If you want our representative to call, check here —.

A NEW DAY FOR SHEET METAL WORKERS

Truly modern homes are a maze of sheet metal. No longer do older standards of appearance suffice. Basements must be finished like the rest of the house. Modern heating and air-conditioning call for materials and workmanship that make older standards obsolete. Meeting this challenge of modernization means a new day for the sheet metal worker.



Superior galvanized sheets—of special-analysis open-hearth steel—are noted for their uniformity of temper and gauge. The zinc coating applied by the SUPERIOR process is uniform and flawless. Superior Sheets are economical in the shop because they work well and reduce spoilage. Wherever they have been used they enjoy first preference for double seaming and severe forming.

SUPERIOR GALVANNEALED

Here is a sheet that offers distinct advantages for duct work and other installations in modern construction. Superior Galvannealed is made of special-analysis open-hearth steel of exceptional workability, suitable for stamping, drawing, and sharp bending. It is highly rust resistant because its heat-treated zinc coating does not fracture through severe forming operations. The heat-treatment produces a "toothed" surface that takes and holds paint, lacquer and enamel finishes.

All Superior Sheets are supplied in a variety of shapes and sizes. Also in copper-bearing base and special tempers. Available through established jobbing channels.

THE SUPERIOR SHEET STEEL CO., Canton, Ohio
Division of CONTINENTAL STEEL CORP., U. S. A.

SUPERIOR

OPEN HEARTH STEEL SHEETS

Galvanized—

Sheets
Roofing

Galvannealed
"Super-Metal"

Long Terns
Hot Rolled

Annealed
De-oxydized



A Survey of Air Conditioning in Real Estate Developments

A QUESTION frequently heard of late is—"Will air conditioning be used in the lower priced houses erected by the real estate developer?"

An answer might be:

"Winter air conditioning in homes selling for as low as \$6,000 may soon be the rule rather than the exception."

At least, this is the indication from large scale construction of low to medium priced houses now being built in various parts of the country.

In Missouri and Kansas, where builders are again active because of the stimulation given by the Insured Mortgage System of the Federal Housing Administration, air conditioning, warm air furnaces are being installed as standard equipment, and insulation, to provide a maximum of all-season comfort while making for low fuel cost, is finding wider acceptance and use, particularly with air conditioned homes.

True, these air conditioning systems do not include summer cooling, but the systems perform the necessary filtering, humidifying heating, and circulating. Insulation, on the other hand, varies with the type of construction. In some instances all exposed walls and ceilings are insulated; in other cases only the ceilings; while in all cases insulating includes calking of window frames and weatherstripping.

Price and the ideas of the builders govern the equipment in homes built for sale. Apparently most prospective home owners who build on contract have definite ideas on heating, air conditioning and insulating, but they depend upon the contractor for advice and assist-

ance, at the same time keeping an eye on costs. Perhaps a quick glance at several typical developments will give some idea of the field.

Kansas City, Mo.

One of the large developments of individual homes where air conditioning furnaces are used is that operated by W. H. Shackelford & Son, at Westmoreland Park, just over the line from Kansas City, Missouri. In the past two years this firm has built and sold approximately 90 homes. At Westmoreland Park, six to seven-room homes, fully equipped and on building lots measuring 50 x 150 feet, sell for \$6,000 to \$8,000, depending upon the type of construction. Winter air conditioning, gas fired furnaces, are standard equipment in every home. Two makes of nationally advertised equipment are used. Ceilings are insulated and rock lath, coated with metal, is used as plaster base on the walls. Windows are weatherstripped. Warm air registers are located on the inside walls, about six feet up, with cold air returns in the baseboard.

Gravity warm air heat was changed to forced circulation in the homes which The Schutzel-Harding Investment and Building Company built in Raytown and in the Country Club district of Kansas City. These homes, of the bungalow type, contain six rooms and are on building lots 50 x 150 feet. Finishing of the attic for one or two sleeping rooms with a porch and half bath, permits large living and dining rooms on the first floor.

(Continued on page 156)

A Nomograph Chart for Calculating Heating Costs

By J. Donald Kroeker

Columbia Engineering Co.

LOGICAL heating cost estimates are annually made on the basis of the degree days established for a locality, or from data which can be determined from Weather Bureau records; from heat loss figures, for the building in question; from information as to the fuel; and from estimates or knowledge of the overall thermal efficiency of the heating plant.

These factors are related as follows:

$$C = 24 \frac{H \times P \times D}{V \times E \times t_d}$$

in which:

C = the seasonal heating cost for the *average heating season*

H = the heat loss from the building in Btu per hour

P = the price per unit of the fuel in dollars

D = the seasonal heating coefficient for the locality in degree days

V = the total heating value of the fuel in Btu per unit

t_d = the design temperature difference in degrees Fahrenheit on the basis of which H was determined

E = the thermal efficiency of the system expressed as a decimal.

For any one locality and for the majority of the calculations to be made in it, a further locality coefficient or factor may be established to combine the only constant in the formula and the two factors which are usually constant for the locality; namely, D and t_d . If we call this combined factor "f," then the above formula becomes:

$$C = \frac{H \times D \times f}{V \times E}$$

$$\text{where } f = 24 \frac{D}{t_d}$$

Thus for any one locality, the seasonal heating coefficient is divided by the design temperature difference and multiplied by 24 to obtain the factor "f." Unless the design temperature difference is changed, such as is the case in computing the heat loss from an industrial, rather than commercial or residential building, the factor "f" is a constant for any locality, and the use of it will save considerable time, if a number of calculations are involved.

Considerable care and sometimes a little judgment must be used if seasonal heating costs are to be deter-

mined with accuracy, especially in applying the seasonal heating coefficient and in selection of the proper thermal efficiency value.

Probably the chief considerations, which must be borne in mind in applying the heating coefficient are the maintained temperature and the climatic characteristics.

Allowance can be made with fair accuracy for considerable difference, such as between day and night, in maintained temperatures of systems in daily use. Somewhat more involved calculations are necessary in computing the heating costs for buildings used intermittently, although maintained temperatures during use are the same. Here it is necessary to determine the heat capacities of the buildings, based on differences between inside and average outside temperatures, which must be added to the heat requirements as determined from the percentages of the heating coefficient actually applicable. These adjustments can also be made for this purpose in the heat loss figures, or a simple percentage may be used.

Of course, great accuracy cannot be claimed for such calculations and much greater variations from heating estimates of this nature are to be expected than from those made for buildings with closely maintained indoor temperatures.

Climatic Influences

Climatic characteristics which it is necessary to consider seem to be wind conditions, which should, however, have been given proper consideration in making the heat loss calculations; relation of maximum to average monthly requirements; and magnitude of the seasonal heating coefficient, or, in other words, the severity of the normal heating season. It has been shown, however, that, on the whole, this coefficient, as established from U. S. Weather Bureau records, applies accurately, except in very mild climates; namely, those having less than 2,500 degree days, for which no definite, generally applicable, corrections are known to be in use.

Values of the seasonal heating coefficient are available for cities of the United States in the form of "Degree Day" tables, such as Table I, or may be selected with fair accuracy from "Isodegree day" maps* which are contained in certain periodical literature.

The factor in the above formula which is most difficult to determine for all cases is that of efficiency, which should represent the ratio of the heat delivered usefully to the building and the heat input for the season. It is likely to be considerably lower than may be obtained

*American Gas Association Industrial Gas Series, House Heating.

TABLE I
Heating Coefficients for Cities in the United States, in Degree Days

Alabama	Birmingham	2408	Nevada	Reno	5891
	Mobile	1471	N. H.	Concord	6852
Arizona	Flagstaff	7145	New Jersey...	Atlantic City	5175
	Tucson	1845		Trenton	4934
Arkansas	Hot Springs	2665	N. Mexico ..	Santa Fe	6063
	Little Rock	2811	New York ...	Albany	6889
California ...	Los Angeles	1504		Buffalo	6821
	San Francisco	3264		New York	5348
Colorado	Colorado Springs	6553		Utica	6785
	Denver	5873	N. C.	Raleigh	3234
Connecticut ...	New Haven	5895		Wilmington	2302
D. C.	Washington	4626	N. Dakota ...	Bismarck	8498
Florida	Jacksonville	890	Ohio	Cincinnati	4702
Georgia	Atlanta	2891		Cleveland	6154
	Savannah	1490		Columbus	5323
Idaho	Boise	4558	Oklahoma ...	Oklahoma City	3613
	Lewiston	4924	Oregon	Portland	4468
Illinois	Chicago	6315		Salem	4629
	Springfield	5370	Penna.	Philadelphia	4855
Indiana	Evansville	4164		Pittsburgh	5235
	Indianapolis	5297	R. I.	Providence	6014
Iowa	Des Moines	6373	S. C.	Charleston	1769
	Sioux City	7023		Spartanburg	3257
Kansas	Dodge City	5034	S. Dakota ...	Sioux Falls	7683
	Topeka	5301	Tennessee ...	Memphis	2950
Kentucky	Lexington	4616		Nashville	3578
	Louisville	4180	Texas	Austin	1578
La.	New Orleans	1023		Dallas	2455
Maine	Eastport	8531		Houston	1157
	Portland	7012		San Antonio	1202
Maryland ...	Baltimore	4533	Utah	Logan	6735
Mass.	Boston	6045		Salt Lake City	5553
	Springfield	6464	Vermont	Burlington	7620
Michigan	Detroit	6494	Virginia	Fredericksburg	4243
	Marquette	8692		Norfolk	3349
Minnesota ...	Duluth	9480		Richmond	3725
	Minneapolis	7851	Washington ..	Seattle	4968
Miss.	Vicksburg	1822		Spokane	6353
Missouri	Kansas City	5202	W. Va.	Morgantown	5016
	St. Louis	4585		Parkersburg	4884
Montana	Billings	7115	Wisconsin ...	Fond du Lac	7612
	Havre	8699		Green Bay	7823
Nebraska	Lincoln	6231		La Crosse	7290
	Omaha	6128		Milwaukee	7372
			Wyoming ...	Cheyenne	7462

with good firing at selected combustion rates and may depend as much on the nature and engineering thoroughness of the installation as on the heating appliance itself. It is most accurately predictable for systems designed for and used on certain fuels at fixed input rates while in operation, such as gaseous or fluid fuels under thermostatic control. It is somewhat less fixed for solid-fuel burning equipment converted to these fuels, but is still sufficiently reliable for use in making heating estimates.

For solid fuels, efficiencies depend so much on firing methods that they can rarely be given within five per cent.

Any overall thermal efficiency values given for any fuels are certain to be challenged by engineers engaged in the utilization of those fuels. However, values believed to be average for small or domestic systems are given in the table below. Higher efficiencies are com-

mon with many heating installations and certain locations of chimneys, but the following are believed to be average. Proper installation, adjustment, and maintenance of automatic equipment as well as proper operation of manually fired equipment will show high efficiencies.

The value for heat loss from a structure used in the above equations should never be obtained "roughly" from the area of installed radiation or area of warm air pipes or registers, if any degree of accuracy is desired, because radiation and warm air supply equipment are very seldom installed to exactly offset heat losses and may be either over- or undersized. Among other things, if a heating cost estimate is to be worth anything at all, it should be based on conscientiously made heat loss calculations, taking into account computed infiltration, rather than infiltration by an arbitrarily selected number of air changes.

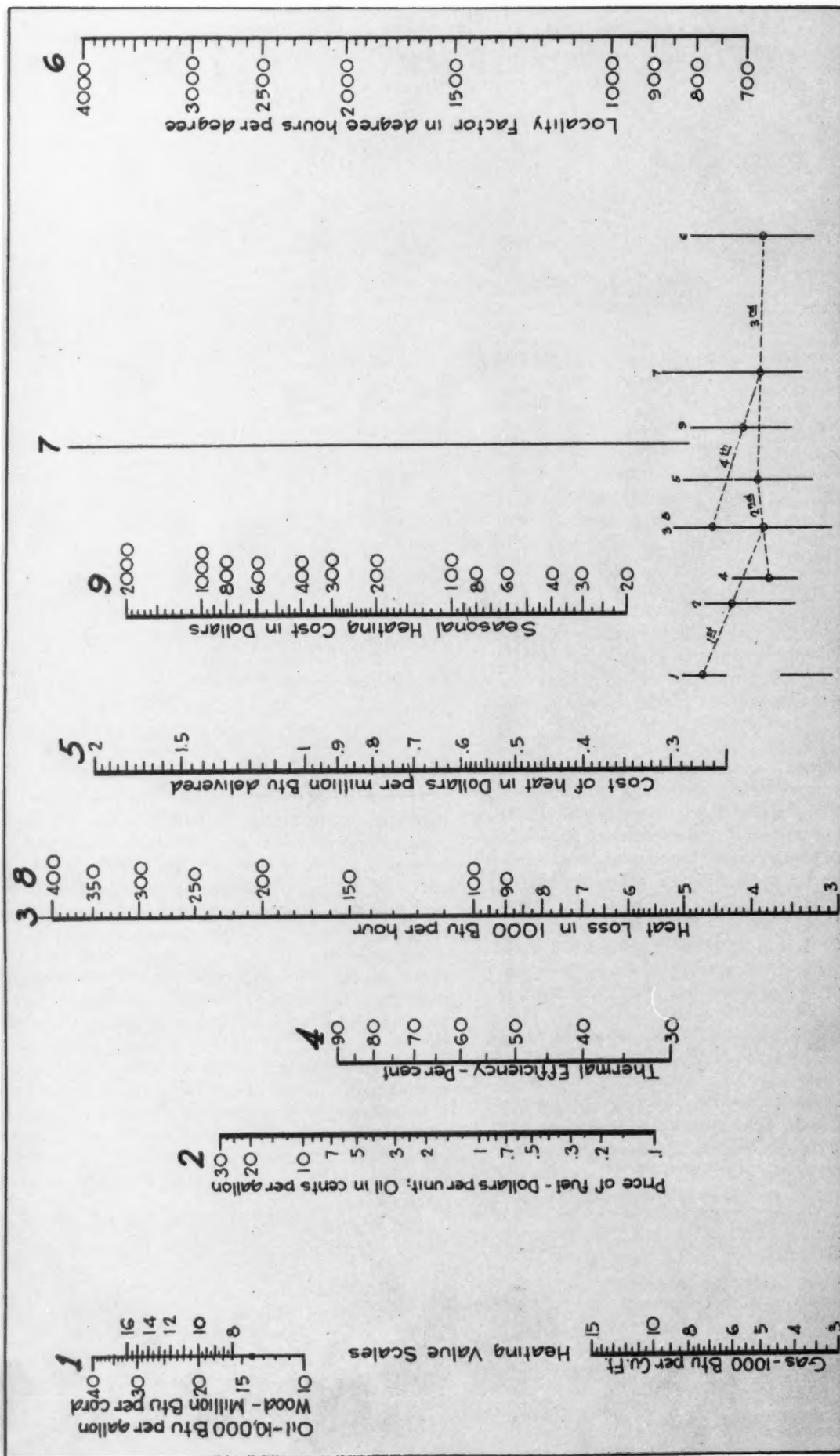
The formula above, expressing the relation between the factors involved in calculation of heating costs may be solved very simply by means of the chart shown.

Heating values are found on the scales at the extreme left, for wood in Btu per cord, coal in Btu per pound, oil in Btu per gallon, and gas in Btu per cubic foot. On scale 2 are found, at the left, prices in dollars per cord of wood, per ton of coal, and per thousand cubic feet of gas; and in cents per gallon of oil.

Aligning values on these two scales gives intercepts on line 3.

TABLE II

Fuel	Equipment	Efficiency
		%
1. Oil	a. Warm air furnace designed for oil..	70
	b. Converted warm air furnace.....	50-60
	c. Boiler designed for oil.....	75
	d. Converted boiler	55-65
2. Gas	a. Warm air furnace designed for gas..	75
	b. Converted warm air furnace.....	60-70
	c. Boiler designed for gas.....	80
	d. Converted boiler	65-75
3. Coal	a. Bituminous	40-55
	b. Anthracite	45-60
4. Wood		35-60



As an example of the use of this chart—suppose we are burning oil having a heating value of 140,000 Btu per gal. at 5c per gal. 60% efficiency for the furnace, total heat loss 90,000 Btu, design temperature difference 70 deg. F. and the seasonal heating coefficient is 4,800 deg. days what is the seasonal cost? Our locality factor is 24 times 4,800 divided by 70 equals 1,645. Place a ruler from 140,000 on scale 1 to 5c on scale 2 to obtain a point on line 3. Hold point on line 3 and swing ruler to 60% on scale 4 and read cost per million Btu (\$0.59½) on scale 5. Place ruler from locality factor (1,645) on scale 6 to cost per unit (\$0.59½) on scale 6 and obtain a point on line 7. Place ruler from this point on line 7 to 90,000 Btu heat loss on scale 8 and read total seasonal heating cost (\$88.40) on scale 9.

The overall thermal efficiency of the heating plant location on scale 4 is aligned with scale 3 to intercept scale 5, reading cost per million Btu of delivered heat. Alignment to this scale may be used to compare heating costs with various fuels, without regard to any particular installation.

Now the locality factor "f" is determined, found on scale 6, and aligned with cost per million Btu of delivered heat on scale 5 to intercept line 7. This intercept is now aligned with scale 8, heat loss in Btu per hour, to intercept scale 9, on which seasonal heating cost is read directly.

Briefly, we align in the order of the scale numbers, or, consulting the key shown on the chart, we may codify the procedure as follows:

1. Align 1 and 2 and hold 3,
2. Align 3 and 4 and read (or hold) 5,
3. Align 5 and 6 and hold 7, and
4. Align 7 and 8 and read 9, the seasonal heating cost.

An Example Problem

Taking a concrete example, assume the heating value of oil at 140,000 Btu per gallon, the price at 5c per gallon, efficiency at 60 per cent, heat loss of the building at 90,000 Btu per hour, design temperature difference at 70 degrees F., and the seasonal heating coefficient at 4,800 degree days, and that it is required to know the seasonal heating cost.

$$\text{The locality factor "f" is } 24 \frac{4,800}{70} \text{ or } 1,645.$$

On the first scale, middle section, locate the heating value of the oil, 140,000; and on the right side of scale 2 locate the price of the oil, 5 cents; then align these to obtain a point on line 3. Holding this point and aligning it with the efficiency on scale 4, 60 per cent, read the cost per million Btu of delivered heat on scale 5; namely, \$0.59½.

Now locate the locality factor, 1,645, on scale 6 and align this with the cost per unit on scale 5, to obtain a point on line 7. Align this point with the heat loss, 90,000 Btu per hour, on scale 8, and read the seasonal heating cost, \$88.40, on scale 9.

In making a comparison of the cost of using different fuels in any heating system or any class of heating systems, scales 1, 2, 3, 4, and 5 are used.

Say, we wish to know the price of 1,000-Btu per cubic foot natural gas used in a system 70 per cent efficient which will be equal in operating cost to a 6-cent per gallon, 140,000-Btu per gallon oil burned in a system 60 per cent efficient.

Align 140,000 on the section giving heat values of oil on the first scale, with 6 cents per gallon on scale 2, obtaining a point on line 3; align this point with 60 per cent on scale 4, and obtain a point on or read scale 5. This point, aligned with 70 per cent, the efficiency on gas, on scale 4 will give a point on scale 3, which, aligned with 1,000 on the lower section of the first scale, the heating value of the gas in question, will intercept scale 2 at \$0.50, which is the price of gas per 1,000 cubic feet to equal in heating cost the 6-cent oil in this particular comparison. If the price of gas is actually 75 cents per thousand cubic feet, then the relation of the cost of oil and gas at the prescribed conditions is as 50 to 75, or oil heating is one-third less.

Fuel Heating Values

A convenient table of heating values of fuels is given below. It is taken from selected sources. The heating values of all fuels are subject to fluctuation; in coal, with the particular portion of a mine or field, in natural gas with the field, in manufactured gas with each unit of manufacture, etc. Probably the least variation occurs in manufactured gas, which is required to be held within narrow limits as to its heating value. If calculations are made on the basis of gas fuel, inquiry should be made at the local gas plant as to the heating value which is maintained.

TABLE II
HEATING VALUES OF COAL, BTU PER POUND

Source	Heating Value
Pennsylvania—Anthracite	
Lehigh valley	12,640
Average	12,472
Treverton	14,025
Colorado—Anthracite	
Crested Butte, No. 1 bed.....	14,503
Floresta, Ruby mine.....	13,920
Somerset	12,807
New Mexico—Anthracite	
Madrid, White Ash bed.....	14,071
Rhode Island—Anthracite	
Portsmouth, Middle 6-ft. bed.....	10,737
Alabama, average	14,000
Warrior, Jefferson bed.....	15,150
Coal valley	12,880
Arkansas, Clarksville, Hartford, average.....	14,140
Colorado, average	12,700
Illinois, average	12,500
Indiana, average	13,300
Clinton No. 4 bed.....	11,300
Iowa, average	12,800
Kansas, average	12,300
West Mineral	13,400
Kentucky, average	14,400
Sturgis	12,720
Maryland, average	14,100
Michigan, Saginaw	13,370
Missouri, average	12,500
Montana, average	11,700
Belt	10,890
New Mexico, average	13,000
North Dakota, average.....	10,800
Ohio, average	13,300
Oklahoma, average	113,500
Pennsylvania, average	14,200
Tennessee, average	14,200
Texas, average	10,600
Eagle Pass	9,200
Utah, average	13,000
Thompson	11,320
Virginia, average	14,800
West Virginia, average.....	14,500
Washington, average	13,100
Wyoming, average	12,600

HEATING VALUES OF OIL—BTU PER GALLON

No.	Gravity*	Class	Heating Value
1	36-40	Light Domestic fuel.....	136,000
2	32-36	Medium Domestic fuel.....	138,500
3	28-32	Heavy Domestic fuel.....	141,000
4	24-28	Light Industrial fuel.....	145,000
5	18-24	Medium Industrial fuel.....	149,000
6	12-18	Heavy Industrial fuel.....	151,000

Crude Oil Source	Gravity*	Heating Value
California	22.8	144,000
Kansas	22.0	147,000
Mexican	13.6	152,000
Oklahoma	31.3	141,000
Pennsylvania	42.6	132,000
Texas	30.2	142,000
Wyoming	31.5	141,000

*Gravity is given in degrees, A.P.I.

(Continued on page 149)

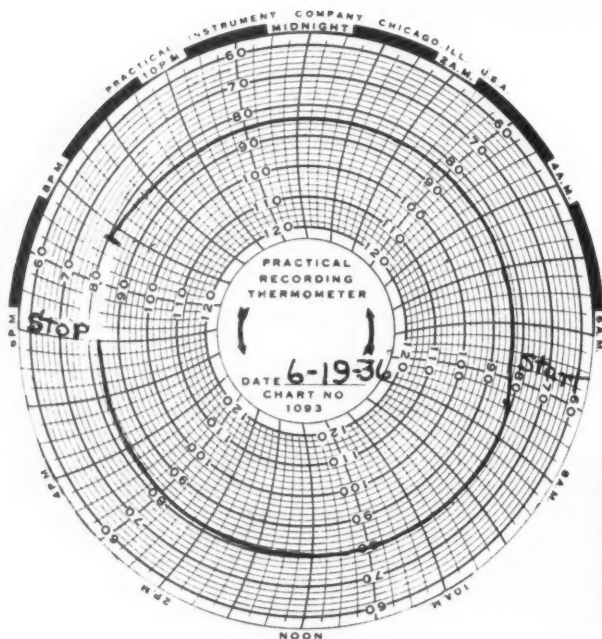


Fig. 3 — Left, inside temperatures with system operating.

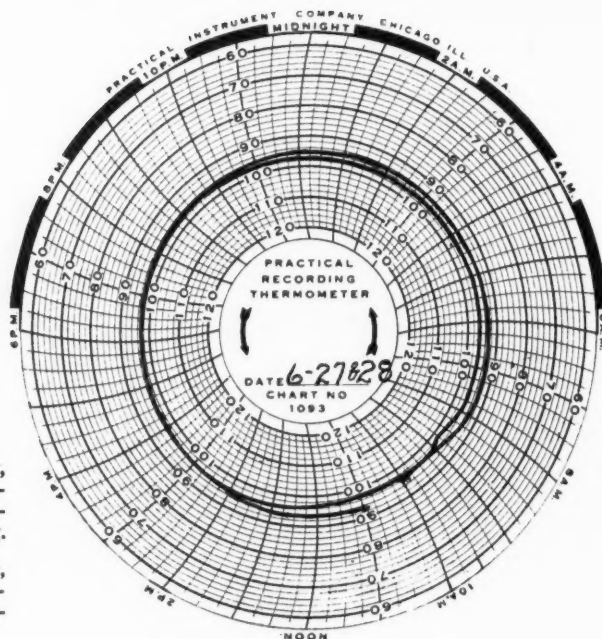


Fig. 4 — Right, inside temperatures with system idle.

A Low Cost Cooling System

By M. W. Pehl

Kansas City School of Engineering

VERY frequently the problem arises of how to cool a given area at a price for equipment below the costs ordinarily quoted. Ways and means of cutting cost corners must be resorted to. Last spring a problem of this kind was put up to the writer and the solution of it may be of interest to the sheet metal shop-owner.

The problem was the comfort cooling for summer operation of a one-story office Kansas City building consisting of one main office approximately 31 feet by 31 feet with seven people working at desks, two private offices and one consulting room where sometimes as many as ten people could be seated for a conference. The owners had been quoted a price of \$1,500 for a cooling system the year previous, but this price was beyond the figure that the owners were willing to invest for a system of cooling for a building that they had under a short time lease.

The owners had specified as one of their wishes that an air-washer, rather than a direct expansion coil, be used if it could be done at a reasonable price.

The total heat gain per hour was estimated at 36,000 Btu. of sensible heat, the latent heat in grains of moisture being taken as the indication of how low the "dew point" temperature should be depressed in order to take out the excess moisture given up by the people.

One of the first pieces of equipment needed was a three-ton compressor, and a used ammonia compressor that could be bought for \$185 complete with motor, condensing coils and valves was found.

A set of expansion coils were made up of 1¼-inch extra heavy pipe and welded to a frame that would fit

into the spray chamber of the air-washer. The air-washer was designed as a vertical type so that it would take up as little floor space as possible. Fig. 1 shows an elevation drawing of the washer with cut away section showing the details of construction and parts. Seven spray nozzles installed in a manifold grid gave splendid results as a cooling and dehumidifying unit.

The expansion coil was submerged in the water tank, and kept the water at a fairly even temperature of 48 degrees. Eliminator plates set above the spray nozzles removed all of the free moisture that was carried up with the air flow. The blower was mounted on rubber cushion insulators with the motor and drive outside the unit itself. When the blower was first started, considerable noise was carried through the short duct system into the office room. This was overcome by installing turning blades in the elbow as shown, with results beyond expectations.

The blower had a rated capacity of 3,000 cfm. and the motor rating was 1 HP at 1750 rpm. An adjustable speed pulley was installed on the motor shaft to change the rotor speed to suit requirements. The pump and motor were of the combination type and rated 20 gallons per minute with a head of 30 feet, which gave a very fine water spray in the spray chamber. With this installation outside air could not be introduced without cutting a hole through the roof and running a duct from the roof to the return air duct, so it was decided to try operating the system with all of the air being recirculated. It was found that the several doors from the outside, store room, and warehouse were

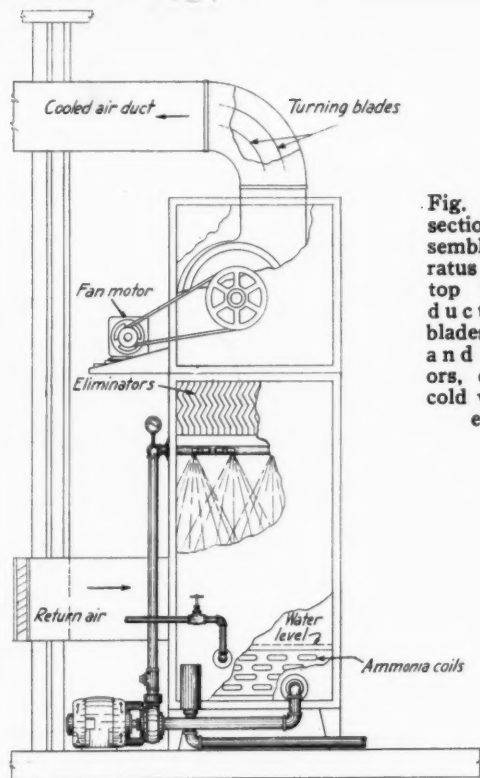


Fig. 1 — Cross section of assembled apparatus showing top blower, duct turning blades, sprays and eliminators, coil and cold water reservoir.

opened so often that enough fresh air was admitted into the room in this manner.

As can be seen from the plan of the project, the duct layout was very simple, only one short run being necessary. One of the ideas tried was to eliminate the supply register or grilles. The outlet opening was left with just a metal frame around the edge of the outlet,

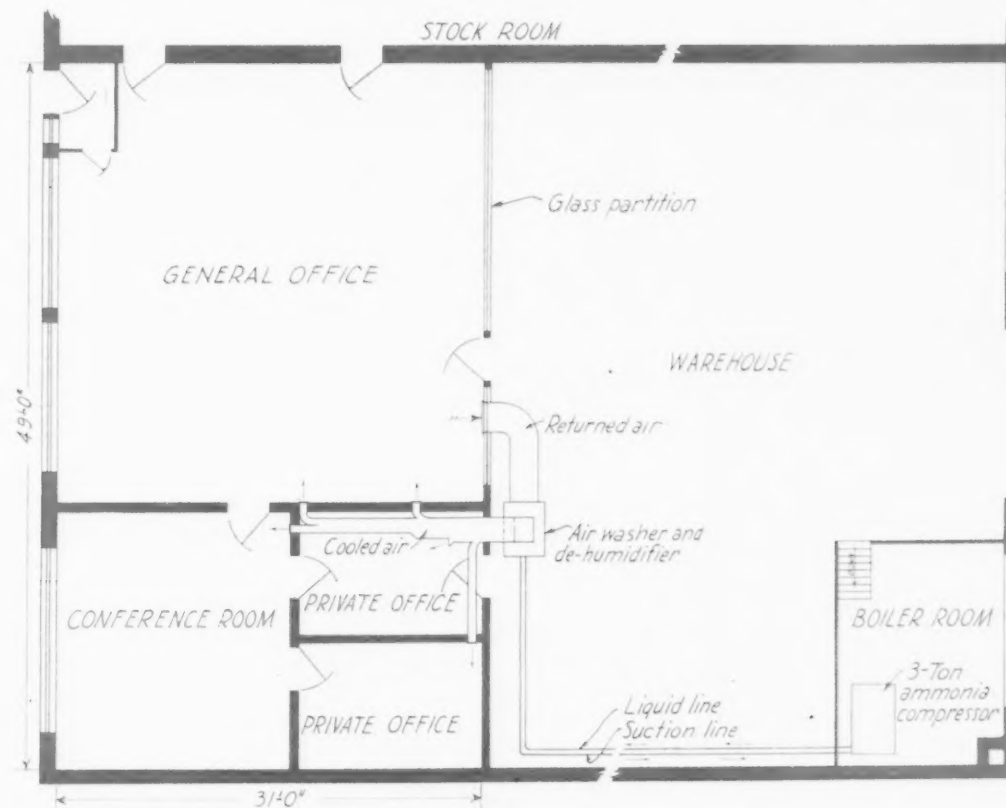
and the results more than justified the change. The velocity of the air at the outlet was taken at 1,400 feet measured with an anemometer, and with no grille or register to set up air whistling the noise was not perceptible. A very noticeable movement of air could be felt in any part of the room, as the air stream carried clear across the room and rebounded from the wall and was directed back across the room to the return air opening.

The compressor was installed in a basement boiler room at the rear of the building where water, sewer, and electricity were available. The liquid line and suction lines were run against the wall, a distance of about 80 feet to the cooling unit. Insulation of 2-inch cork was applied to the suction line to save the loss of cooling effect off the pipe. After a number of tests had been made and the unit adjusted to operate at its most effective range, a 24-hour record was taken on June 10, 1936, with a recording thermometer (shown in Fig. 3) starting at seven A.M. with a temperature of 84 in the office. It held the temperature to 80 up till noon and then gradually increased to 84 by six P.M. with an outside temperature of 108 degrees at three P.M. A comparison of temperature in the offices is shown by the chart 4, which was run for two days, Saturday and Sunday, July 27 and 28, 1936.

The total cost of this installation, including the coils, insulation for suction lines, and the cooling unit itself was approximately \$650 and the operating cost 96 cents per day for electricity and water.

All through the summer, this unit gave remarkable service and has made the office a pleasant place in which to work. The only comment heard was to the effect it had made the office help all dissatisfied with their home at night and Sundays.

Fig. 2—Plan of offices showing location of cooling unit with remote compressor and connecting piping, location of ducts and supply openings and the single return from the general office. Open doors admit sufficient outside air.



Study Courses in Heating, Ventilating and Air Conditioning

DUE to the many requests for information relative to instructional courses offered in heating, ventilating and air conditioning, inquiry was made to the registrars of over 100 universities, colleges, and technical schools requesting an outline of courses offered in these subjects for the years 1936-37. From the data submitted by the various institutions the following information was tabulated for quick reference. As additional information is obtained supplementary tables

will be published in following issues during 1937.

It should be noted that several of these schools give courses in heating, ventilating and air conditioning in connection with a full undergraduate program in mechanical engineering, and in some instances graduate school instruction is offered for those desiring to specialize in this field of engineering. Information is also given for those individuals desiring evening instruction or correspondence courses.

Universities, Colleges and Technical Schools Offering Courses in Heating, Ventilating and Air Conditioning, 1936-37

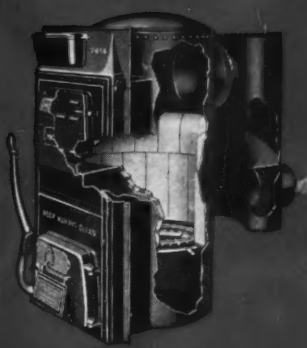
NAME	ADDRESS	INSTRUCTORS	SESSION	FEE	SUBJECTS TAUGHT	REMARKS	EDUCATIONAL REQUIREMENTS
EAST Carnegie Institute of Technology	Pittsburgh, Pa.	C. M. Humphreys	Day Evening	\$300 per year \$35-\$40 per yr.	Basic Thermodynamics, Plumbing, Heating, Ventilating Basic Thermodynamics, Plumbing, Heating, Ventilating, Air Conditioning	4-year Mech. Engr. Option in Plumbing, Heating, Ventilating, beginning Soph. yr. Courses leading to Certificate and Degrees	Day School—Physics, Mathematics, Thermodynamics and Mechanical Laboratory Evening School—High School Physics and Algebra
Clemson Agricultural College	Clemson, S. C.	D. H. Shenk	Day	Regular Tuition	Basic Thermodynamics, Heating and Ventilating	Option in Mech. Engr. Courses	Senior Standing in Mech. Engr. Thermodynamics, Heat Power
College City of New York	New York, N. Y.	F. W. Hanburger	Evening	\$27.50	Heating and Ventilating	Presented in connection with Architecture and Building Construction Courses	
Columbia Technical Institute	Washington, D. C.	Malcolm Hickox S. L. Richmond	Evening and Correspondence	Tuition fee	Heating, Ventilating and Air Conditioning	Option in Mech. Engr. and one-year Certificate Course	No Restrictions
Columbia University	New York, N. Y.	R. W. Waterfill C. A. Bulkeley	Evening	\$30 per course	Elementary and Advanced Courses in Air Conditioning	Presented in School of Architecture	
Connecticut State College	Storrs, Conn.	W. L. Edel	Day	Regular Tuition	Basic Thermodynamics, Heat Engineering	Courses in Mech. Engr.	Senior Standing in Engineering
Cornell University	Ithaca, N. Y.	F. O. Ellenwood C. O. Mackey	Day	Regular Tuition	Basic Thermodynamics, Air Conditioning, Refrigeration	Graduate Courses and Required or Optional in Mech. Engr.	Senior Standing in Mech. Engr.
Drexel Institute of Technology	Philadelphia, Pa.	E. J. Berlet J. H. Rushton	Evening	Regular Tuition	Basic Thermodynamics, Air Conditioning	Diploma Course in Mech. Engr.	Four-yr. Course—High School Education Post Graduate Course—Mech. Engr. Certificate
Georgia School of Technology	Atlanta, Ga.	R. S. King	Day and Evening	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Refrigeration	Presented in Mech. Engr. Course	Day School—Senior Standing in Engineering Evening School—Prefer Full High School Mathematics
Harvard University	Cambridge, Mass.	C. H. Berry F. R. Ellis C. P. Yaglou	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Graduate Courses and Required or Elective in Mech. Engr.	Graduation from Recognized College
Herkimer Institute	New York, N. Y.	J. L. Blackshaw	Day and Evening	Tuition fee	Air Conditioning and Refrigeration		
International Correspondence Schools	Seranton, Pa.	B. B. Mahon	Correspondence	Course fee	Air Conditioning		Be able to read and write English
Lehigh University	Bethlehem, Pa.	B. H. Jennings	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Required and Elective in Mech. Engr.	Satisfactory Standing in College Mech. Engr.
Massachusetts Institute of Technology	Cambridge, Mass.	James Holt	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, and Air Conditioning	Graduate Courses and Required or Elective in Mech. Engr.	
Massachusetts University Extension Division	Boston, Mass.	J. A. Moyer	Correspondence	Course fees	Air Conditioning		High School Education
Newark College of Engineering	Newark, N. J.	F. D. Carvin	Day and Evening	\$30	Heating and Ventilating	Senior Mech. Engr. Course	Senior Standing in Mech. Engr.
New York University	New York, N. Y.	M. C. Giannini	Day and Evening	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	2-year Certificate Program and Graduate Courses in Mech. Engr.	Evening School—Four-year High School Certificate Graduate School—Four-year College Engineering
Pennsylvania State College	State College, Pa.	H. A. Everett	Day	Regular Tuition	Basic Thermodynamics, Heating and Ventilating	Required Course in Mech. Engr.	
Polytechnic Institute of Brooklyn	Brooklyn, N. Y.	John James	Evening	\$35 per semester	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Elective Course in Mech. Engr.	Elementary Course—High School Education Advanced Course—College or Engineering Degree



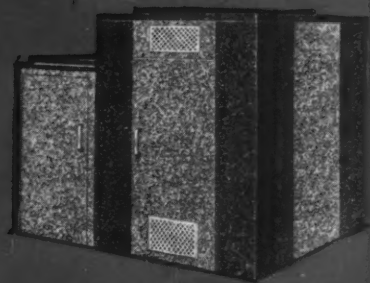
Series "C"
Cast Furnace



Series "D"
Steel Furnace



Series "S"
Steel Furnace



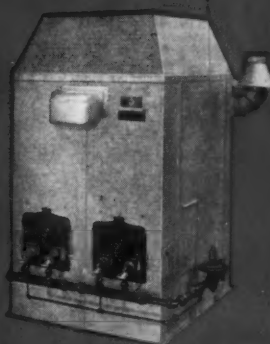
Moncrief "Aristocrat" Oil-Fire
Air Conditioning System



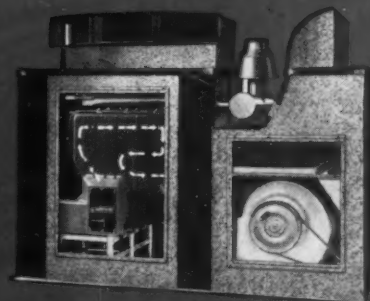
Series "F"
Cast Furnace



Series "E"
Steel Furnace



Series "B"
Gas Furnace



Moncrief "CBF" Gas
Air Conditioning System



Miles Junior
Air Conditioner



Moncrief "Aristocrat" Air
Conditioning System—for
coal, hand or stoker fired.

MONCRIEF

for all that is best in

AIR CONDITIONING SYSTEMS

and **WARM AIR FURNACES**

● In the comprehensive Moncrief line, dealers are able to fulfill every demand in their communities for warm air heating and air conditioning equipment . . . including everything in pipe, fittings and accessories.

Moncrief Engineering Service helps you to figure and install jobs profitably.

The Moncrief Special Finance Plan helps you make sales easily.

Write today for particulars of the Moncrief Proposition.

THE HENRY FURNACE & FOUNDRY CO.

3473 EAST 49th STREET, CLEVELAND, OHIO

FAN WHEELS and ASSEMBLIES
for every
FORCED AIR HEATING
and AIR CONDITIONING NEED

**Even in These Small Units
 We Maintain the Traditional
 Clarage Quality Standards**

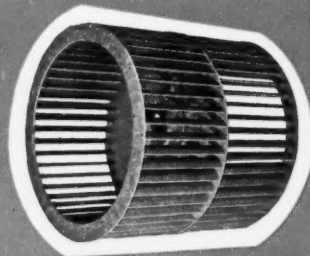
Furnace and air conditioning manufacturers and dealers find Clarage a dependable source of supply. This small fan equipment is backed by sound, conservative engineering, and a quarter-century of experience. It is built to the same standards of excellence which have made the larger types of Clarage air handling and conditioning products **FIRST CHOICE** of discriminating buyers the world over.



DUPLEX FANS

A Duplex Unit, offered in ten sizes, consists of two Complete Fans mounted together on one base as shown above. Both wheels are mounted on one shaft turning on self-aligning ball bearings.

All of these small Clarage Fans are **EXCEEDINGLY QUIET IN OPERATION**, when driven either by V-belt drive or direct connected to motor. This silent performance is assured by **SLOW SPEEDS**, perfectly balanced wheels, and the use of highest-grade bearings.

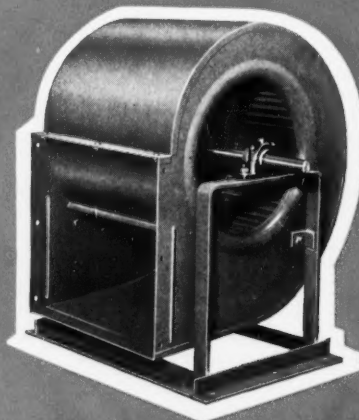


ANY CAPACITY—ANY SPEED

Clarage Wheels can be furnished in ten sizes and in a variety of widths in each size, thus meeting any capacity demand at any operating speed.

These Wheels are of the Double Multiblade Type as shown above, built with two sets of perfectly formed blades securely anchored to the center plate and rims. Each Wheel is **BOTH STATICALLY AND DYNAMICALLY BALANCED**—quiet, smooth-running and free from vibration.

Housings, too, in any of ten sizes can be furnished separately where required.



COMPLETE FANS

A Complete Fan, offered in ten different sizes, consists of a Clarage Double Multiblade Wheel, Fan Housing, Shaft, Bearings, Bearing Supports and Base. Bearings are self-aligning and self-lubricating; a bronze-graphite type which requires filling of oil reservoir but once a season. The Shaft is of liberal size to insure ample strength and rigidity.

The entire assembly is **VERY COMPACT AND TAKES EXTREMELY SMALL SPACE**. Cold air inlet boxes can be furnished as part of standard equipment.

Write for Bulletin 32. Better still, have Clarage engineers submit a recommendation covering your particular requirements. We can make favorable deliveries on one to a thousand units.

CLARAGE FAN COMPANY

Kalamazoo • Michigan

Sales Offices in All Principal Cities

COMPLETE AIR CONDITIONING



FANS FOR INDUSTRIAL NEEDS
 MECHANICAL DRAFT EQUIPMENT

NAME	ADDRESS	INSTRUCTORS	SESSION	FEE	SUBJECTS TAUGHT	REMARKS	EDUCATIONAL REQUIREMENTS
Pratt Institute	Brooklyn, N. Y.	J. W. Hunter	Day and Evening	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Required and Elective Mech. Engr. Course	Day School—Junior Standing in Engineering Evening School—Students under 19 years of age, Full High School Course Evening School—Students over 19 years of age, must satisfy the School by personal interview
Rensselaer Polytechnic Institute	Troy, N. Y.	E. A. Fessenden	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Senior Course in Mech. Engr.	Senior Standing in Mech. Engr.
Rutgers University	New Brunswick, N. J.		Correspondence	\$25 per course	Heating, Ventilating, Air Conditioning		Heating and Ventilating—Practical Mathematics, Elementary Drawing Air Conditioning—Ability to handle simple formulas
Stevens Institute of Technology	Hoboken, N. J.	E. H. Fessenden J. I. Yellott	Day	Regular Tuition	Basic Thermodynamics, Heating, Air Conditioning, Ventilating	Graduate Courses and Required or Elective in Mech. Engr.	
University of Delaware	Newark, Del.	R. L. Spencer	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Presented in Mech. Engr. Courses	Junior or Senior Standing in Mech. Engr.
University of Florida	Gainesville, Fla.	N. C. Ebaugh	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Required and Elective Mech. Engr. Course	Senior Standing in Mech. Engr.
University of Maryland	College Park, Md.	R. S. Dill	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Refrigeration	Presented in Mech. Engr. Courses	
University of New Hampshire	Durham, N. H.	E. H. Stoworthy	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating	Required Mech. Engr. Course	Junior Standing in Mech. Engr. or Architecture
University of North Carolina	Raleigh, N. C.	L. L. Vaughan F. B. Turner	Day	Regular Tuition	Basic Thermodynamics, Heating, Air Conditioning, Refrigeration	Presented in Senior Mech. Engr. Course	Senior Standing in Mech. Engr.
			Correspondence	\$7.50 Course	Air Conditioning	Extension Division	
University of Pennsylvania	Philadelphia, Pa.	W. A. Sloan	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating	Presented in Mech. Engr. Course	
Villanova College	Villanova, Pa.	J. S. Morehouse	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Required Senior Course in Mech. Engr.	Senior Standing in Engineering
Virginia Polytechnic Institute	Blacksburg, Va.	J. I. Clower	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Presented in Mech. Engr. Course	Engineering—Senior Standing in Engineering Architecture—Sophomore Standing in Architecture
Wentworth Institute	Boston, Mass.	M. G. Knowles	Day and Evening	Regular Tuition	Air Conditioning	Certificate Course	Day School—High School Certificate or pass entrance examination Evening School—Grounding in Arithmetic and Algebra
West Virginia University	Morgantown, W. Va.	J. B. Grumbein	Day	Regular Tuition	Basic Thermodynamics, Heating and Ventilating	Presented in Mech. Engr. Course	
Worcester Polytechnic Institute	Worcester, Mass.	R. P. Kolb	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating	Presented in Mech. Engr. Course	Senior Standing in Mech. Engr.
Yale University	New Haven, Conn.	L. E. Seeley	Day	Regular Tuition	Basic Thermodynamics, Heating and Air Conditioning	Graduate Courses and Required or Elective Mech. Engr.	
CENTRAL Arkansas State College	State College, Ark.	N. H. Brown	Day	Regular Tuition	Refrigeration and Air Conditioning	Course in Engineering	
Armour Institute of Technology	Chicago, Ill.	Le Roy Shields H. N. Nachman	Day and Evening	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Required in Mech. Engr. Course	Day 3-yr.—Senior Standing in Mech. Engr. Evening—Mathematics and Physics Post Graduate Air Conditioning—Graduate Mech. Engr.
Case School of Applied Science	Cleveland, Ohio	G. L. Tuve C. A. McKeeman	Day and Evening	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Required and Elective in Mech. Engr. Course	Day—Calculus, Physics and Thermodynamics Evening—Algebra, Physics or equivalent in practical experience
Chicago Technical College	Chicago, Ill.	W. T. Hooper Albert Pelletier	Day, Evening, Correspondence	Course Fees	Air Conditioning	Short Course, four to nine months	High School, including Algebra, Geometry, Physics, Chemistry and Mechanical Drawing
Crane Evening School	Chicago, Ill.	G. F. Wetzel	Night		Heating, Ventilating, Air Conditioning	Certificate Course	Physics, Elementary Algebra
David Ranken Jr.	St. Louis, Mo.	Geo. B. Rodenheiser	Day and Evening	Course Fees	Air Conditioning	Course, one to three years	1 yr. High School—Physics and Mathematics
Fenn College	Cleveland, Ohio	Vincent Eaton	Evening	\$31 Elementary \$18.50 Advanced	Elementary and Advanced Air Conditioning		2-yr. High School (including Algebra) plus some first-hand knowledge of Heating and Ventilating equipment. Or Simple Algebra and Physics
Greer Shop Training	Chicago, Ill.		Day 2 mos. Evening 6 mos.	\$100 \$100	Heating, Cooling, Humidity Control, Air Circulation		High School Certificate
Iowa State College	Ames, Iowa	R. A. Norman	Day		Heating, Ventilating, Air Conditioning, Refrigeration	Required in Mech. Engr.	Senior Standing in Mech. Engr.

AMERICAN ARTISAN
RESIDENTIAL AIR CONDITIONING SECTION

January, 1937

NAME	ADDRESS	INSTRUCTORS	SESSION	FEE	SUBJECTS TAUGHT	REMARKS	EDUCATIONAL REQUIREMENTS
Kansas City School of Engineering	Kansas City, Mo.	M. W. Pehl W. E. Cellwork J. J. Draney	Night School Day School	\$75 for 9 mos. \$250 for 9 mos.	Theory, Shop, Mathematics, Drafting Equipment	Graduates qualify for Service- men, Installation Engineer or Salesmen	High School Certificate
Kansas State College	Manhattan, Kan.	A. J. Mack B. B. Brainard	Day	Regular Tuition	Basic Thermodynamics, Heat- ing, Ventilating, Air Con- ditioning	Required and Elective in Mech. Engr. Course	Thermodynamics
Lewis Institute	Chicago, Ill.	V. L. Sherman Mr. Bodinus	Day and Evening	\$25 per term	Air Conditioning, Refrigera- tion		For B. S. Degree—Thermody- namics Others—Judged by maturity and experience and admit- ted for a probationary period
McKim Technical Institute	Akron, Ohio		Day and Evening	\$175.50	Refrigeration and Air Con- ditioning	Combined Course	
Michigan College of Mining and Technology	Houghton, Mich.	A. P. Young	Day	Regular Tuition	Basic Thermodynamics, Heat- ing, Ventilating	Elective in Mech. Engr. Course	Calculus, Physics of Heat, Heat Engines, Thermody- namics, General Chemistry, and Mechanics
Mississippi State College	State College, Miss.	R. C. Carpenter	Day	Regular Tuition	Basic Thermodynamics, Heat- ing, Ventilating	Required in Mech. Engr. Course	
Ohio Mechanics Institute	Cincinnati, Ohio	John T. Faig	Evening		Heating, Ventilating, Air Con- ditioning		Usefulness of course to stu- dent considered rather than academic requirements
Ohio State College	Columbus, Ohio	A. I. Brown	Day	Regular Tuition	Basic Thermodynamics, Heat- ing, Ventilating, Air Con- ditioning	Required and Elective in Mech. Engr. Course	
Oklahoma Agricultural and Mechanical College	Stillwater, Okla.	V. W. Young	Day	Regular Tuition	Basic Thermodynamics, Heat- ing, Ventilating, Air Con- ditioning	Offered in Architectural Dept. and Mech. Engr. Course	
Purdue, University	Lafayette, Ind.	W. T. Miller	Day	Regular Tuition	Basic Thermodynamics, Heat- ing, Ventilating, Air Con- ditioning	Graduate Courses and Re- quired or Elective in Mech. Engr.	Elementary—Elementary Thermodynamics Major—Elementary Thermo- dynamics and Engineering Physics Elementary Design—Ele- mentary Heating, Ventilat- ing and Air Conditioning Major Design—Major Heat- ing, Ventilating and Air Conditioning, Applied Me- chanics and Machine Design
Refrigeration & Air Conditioning Institute, Inc.	Chicago, Ill.	F. L. Howard J. G. Dunville J. H. Burkell	Preparatory train- ing at home. Shopwork, day sessions only	\$172	Air Conditioning with Heat- ing and Ventilating, Do- mestic and Commercial Re- frigeration	Following completion of pre- paratory work, student is given 100 hours practical training in laboratory and shops	Prefer College and High School Graduates. Any technically inclined grade school graduate acceptable
St. Louis Technical Institute	St. Louis, Mo.	O. W. Kothe	Correspondence	Course Fees	Heating, Ventilating, Air Con- ditioning		No restrictions
University of Akron	Akron, Ohio	F. S. Griffin	Day	Regular Tuition	Basic Thermodynamics, Heat- ing, Ventilating	Course in Mech. Engr.	2-yr. Mathematics and Physics which includes Course in Heat
University of Cincinnati	Cincinnati, Ohio	C. A. Joerger	Evening	\$20 per year	Heating and Ventilating	Alternate Course in Air Con- ditioning given 1937	
University of Illinois	Urbana, Ill.	Wm. H. Severns	Day Correspondence	Regular Tuition	Basic Thermodynamics, Heat- ing, Ventilating, Air Con- ditioning	Graduate Courses and Re- quired or Elective in Mech. Engr.	Day—Senior Standing in Me- chanical Engineering with the completion of the un- dergraduate work in Ther- modynamics and Mech. Engr. Laboratory Corres—Four hours of Univ- ersity credit
University of Kentucky	Lexington, Ky.	L. S. O'Bannon James W. May	Day Correspondence	Regular Tuition \$10	Basic Thermodynamics, Heat- ing, Ventilating, Air Con- ditioning	Required or Elective in Mech. Engr. Course	Day—Thermodynamics, Cal- culus and College Physics. Or, Thermodynamics or Heat-Power Engineering Correspondence—None
University of Louisville	Louisville, Ky.	B. M. Bridman, Dean	Day	Regular Tuition	Basic Thermodynamics, Heat- ing, Ventilating, Air Con- ditioning	Course in Mech. Engr.	Integral Calculus and Ther- modynamics
University of Michigan	Ann Arbor, Mich.		Day		Heating, Ventilating, Refrig- eration, Air Conditioning	Required in Mech. Engr.	Junior Standing in Mech. Engr.
University of Minnesota	Minneapolis, Minn.	F. B. Rowley	Day	Regular Tuition	Basic Thermodynamics, Heat- ing, Ventilating, Air Con- ditioning	Graduate Courses and Re- quired or Elective in Mech. Engr.	
University of Missouri	Columbia, Mo.	Mr. Gray	Day	Regular Tuition	Basic Thermodynamics, Heat- ing, Air Conditioning	Course in Mech. Engr.	Jr. 3rd Quarter College— Physics, Thermodynamics and Heat Engineering
University of Nebraska	Lincoln, Neb.	A. E. Luebs	Day	Regular Tuition	Basic Thermodynamics, Re- frigeration, Heating, Ventila- tion	Elective in Mech. Engr. Course	Architects—College Physics Mechanical Engineers—Ther- modynamics
University of Oklahoma	Norman, Okla.	W. H. Carson E. F. Dawson	Day	Regular Tuition	Basic Thermodynamics, Heat- ing, Ventilating, Air Con- ditioning	Graduate Courses and Re- quired or Elective in Mech. Engr.	Junior Standing Thermody- namics
University of Tennessee	Knoxville, Tenn.	C. E. Ferris	Day	Regular Tuition	Basic Thermodynamics, Heat- ing, Ventilating, Air Con- ditioning	Required in Mech. Engr. Course	
University of Wisconsin	Madison, Wis.	G. L. Larson	Day and Correspondence	Regular Tuition	Basic Thermodynamics, Heat- ing, Ventilating, Air Con- ditioning	Graduate Courses and Re- quired or Elective Mech. Engr.	Day—Jr. Standing College of Engineering Correspondence—High School or equivalent

AIR-CONDITIONING INSTRUMENTS AND CONTROLS

Always improving, that's the slogan. The Warm-Air furnace men have marched ahead under its influence. Practically all Friez products are also leaders doing some important job, for which there is no substitute, no competing instrument or control. Exclusive in their originality and reliability and substantial value for any and all air-conditioning installations . . . Look at the three below.



HUMIDISTAT
(Above)

The humidity controller, which has made air-conditions history. It is especially adapted for warm-air systems. More than eighty per cent of all installations use this human hair elemented instrument. Tried universally, it has registered success everywhere.



HAND ASPIRATED PSYCHROMETER
(Above)

The New standard Psychrometer. Accurate, dependable humidity readings right before your eyes. You read the instrument as easily as you read the time on your watch. Low price.



PORTABLE RECORDER
(Right)

Writes records of temperature and humidity on charts the size of filing cards. It is the reliable check on Air-conditions at low price. To satisfy yourself and your customer you must have a reliable witness testifying to what your air-conditioning system is doing, actually hour by hour.

Send for interesting and instructive literature on a complete line of instruments and controls.



FRIEZ of BALTIMORE



Schools of Air Conditioning and Heating

NAME	ADDRESS	INSTRUCTORS	SESSION	FEE	SUBJECTS TAUGHT	REMARKS	EDUCATIONAL REQUIREMENTS
Utilities Engineering Institute	Chicago, Ill.		Correspondence	Depends on Subjects	Refrigeration, Air Conditioning		Refrigeration—8th Grade Air Conditioning—Technical High School
Washington University	St. Louis, Mo.	E. L. Ohle	Day Evening	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Elective in Mech. Engr. Course	Day—1 yr. Physics and 1 yr. Thermodynamics Evening—1 yr. Elementary Thermodynamics
WEST Agricultural and Mechanical College of Texas	College Station, Texas	C. W. Crawford	Day	\$50 per year	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Elective in Mech. Engr. Course	Junior or Senior Standing in College
California Polytechnic School	San Luis Obispo, Calif.	C. E. Knott	Day	\$20 per year	Air Conditioning	Two-year Course, Training for Installation and Maintenance	High School Certificate
International Engineering Institute	Seattle, Wash.	C. W. Parsons	Day, Evening, Correspondence	\$300 per year \$160 (Corres.)	Air Conditioning		
Oregon State College	Corvallis, Oregon	M. C. Phillips W. H. Martin E. C. Willey	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Graduate Courses and Required or Elective in Mech. Engr.	
State College of Washington	Pullman, Wash.	Mr. Thornton	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Elective in Mech. Engr. Course	Junior Standing in Mech. Engr.
University of Arizona	Tucson, Arizona	P. M. Taornburg	Day	Regular Tuition	Basic Thermodynamics, Air Conditioning	Elective in Mech. Engr. Course	
University of California	Berkeley, Calif.	B. M. Woods B. F. Raber L. M. K. Boelter	Day Evening	Regular Tuition \$9 per person ten meetings	Basic Thermodynamics, Heating, Ventilating, Air Conditioning Fundamentals of Air Conditioning	Graduate Courses and Required or Elective in Mech. Engr. Presented by University Extension in San Francisco	Extension Course—No prerequisites Day School—Senior Standing in Mech. Engr.
University of Colorado	Boulder, Colo.	S. L. Simmering	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Required in Mech. Engr. Course	Physics and Thermodynamics



Get on the Profit Side of Heating NOW...

Are you ready for the biggest sales drive in history? Have you a franchise that gives you a positive sales advantage over your competitor—a complete line of modern gas heating appliances that answers every residential and commercial need? Pacific is that line—a respected competitor in any territory or climate.

Write for Complete Catalog

Here's my stand-by

PACIFIC'S
Complete line
OF GAS HEATING
and
AIR CONDITIONING
APPLIANCES

Gravity and Blower Furnaces
Forced Air Unit Furnaces
Overhead Unit Heaters
Gas Steam Radiators
Floor Furnaces Space Heaters
Water Heaters Blowers

Pacific Forced-Air Unit Furnace



Pacific Gas Radiator Co.
HUNTINGTON PARK, CALIFORNIA, U. S. A.

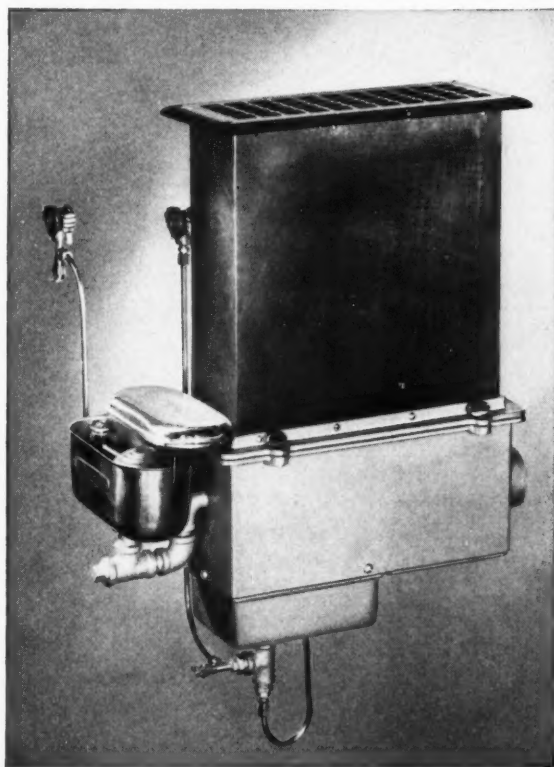
Oldest and Largest Manufacturers of Gas Heating Appliances in the West



Skuttle

AUTOMATIC HUMIDIFIERS

... products of the broadest experience in the industry ... offered in a wide range of types to meet every home requirement.



TYPE GF

First practical solution to problem of properly humidifying radiator-heated homes. Gas burner applies heat to evaporating chamber in proportion to need for more moisture in air. Operates entirely independently of heating plant. May be installed with or without automatic controls. Installation consists only of providing opening for floor grille and making necessary connections. Heat Trap connection prevents liming of water supply valve. Constructed of copper and cast iron for lifetime durability.



TYPE SK-4-T WATERTENDER

For installation with conventional furnace water pans. Equipped with non-liming, non-clogging Skuttle water supply valve. Adjustable. Copper and brass construction throughout. Complete with all fittings, including 10 feet of copper tubing, water shut-off valve, and saddle connector.

FOR COMPLETE DETAILS USE COUPON AT RIGHT

The demand for better atmospheric conditions in the home is great and growing greater. Capitalize on it—profit from it—by putting your efforts behind the most complete line of humidifiers in the industry—the J. L. Skuttle Line. In this line is a type for every home application, including even a new gas-fired unit which offers the first practical solution to the problem of properly humidifying radiator-heated homes. Each Skuttle type incorporates every desirable construction feature contributing to easier and more profitable sales and efficient, dependable operation. Typical is the Skuttle Heat Trap which prevents liming of water supply valves. Illustrated below are the leading Skuttle types. For full information on the complete line and for prices, use the coupon below—today! It is your opportunity to profit from the desire of every home-owner for greater health and comfort from proper humidity.

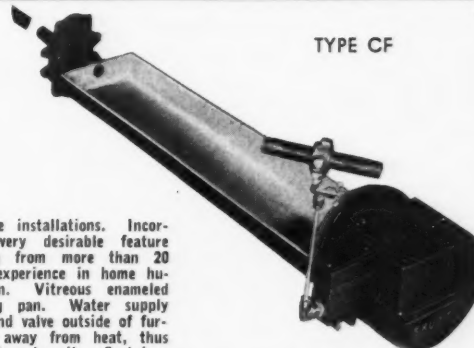


TYPE DS

For bonnet installation in all types of warm air furnaces. Light-weight, drawn-steel evaporating pan insures quick evaporating pick-up. Porcelain enameled inside and out. Heat Trap Connection prevents liming of automatic water supply valve. Brass-to-rubber valve seat contact

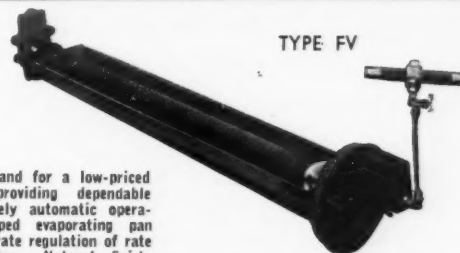
eliminates undesirable chemical reaction of conventional metal-to-metal contact. 195 square inches of water surface area insures ample capacity.

Similar in practically all respects to TYPE DS. Cast iron evaporating pan. Over-flow end of pan may be raised or lowered to decrease or increase water surface area and rate of evaporation. Cast-iron Heat Trap Connection between evaporating pan and water supply chamber. Maximum water surface area, 196 square inches.



TYPE CF

For deluxe installations. Incorporates every desirable feature originating from more than 20 years of experience in home humidification. Vitreous enameled evaporating pan. Water supply chamber and valve outside of furnace and away from heat, thus reducing lime deposits. Cast iron water supply chamber. Evaporating pan scientifically shaped for accurate control of rate of evaporation. Water surface area, 198 square inches.



TYPE FV

Answers demand for a low-priced humidifier providing dependable and completely automatic operation, V-shaped evaporating pan permits accurate regulation of rate of evaporation. Natural finish. Water supply valve located outside of furnace. Maximum water surface area, 168 square inches.

J. L. SKUTTLE CO., 4290 W. FORT ST., DETROIT, MICHIGAN

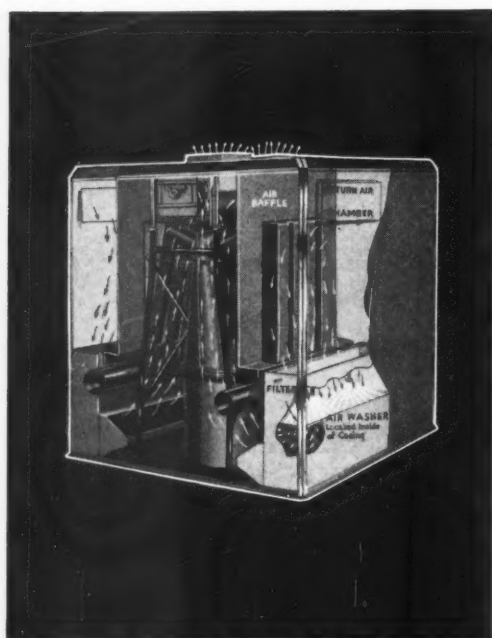
Gentlemen:
Without cost or obligation to me, please mail prices and descriptive literature on your complete line of humidifiers. I am a retailer (); wholesaler (); manufacturer (). Please ask one of your representatives to call ().

FIRM NAME

CITY AND STATE

Schools of Air Conditioning and Heating

NAME	ADDRESS	INSTRUCTORS	SESSION	FEE	SUBJECTS TAUGHT	REMARKS	EDUCATIONAL REQUIREMENTS
University of New Mexico	Albuquerque, N. M.	M. E. Farris	Day	Regular Tuition	Basic Thermodynamics, Air Conditioning	Optional in Mech. Engr. Course	Senior Standing in Mech. Engr.
University of Santa Clara	Santa Clara, Calif.	G. L. Sullivan	Day	Regular Tuition	Basic Thermodynamics, Heating, Air Conditioning	Presented in Mech. Engr. Course	Senior Standing in Mech. Engr.
University of Southern California	Los Angeles, Calif.	T. T. Eyre	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Required in Mech. Engr. Course	Heating, Ventilating, Refrigeration—Junior or Senior Standing in Engineering
University of Texas	Austin, Texas	Mr. Degler	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Elective in Mech. Engr. Course	Air Conditioning—No prerequisites
University of Utah	Salt Lake City, Utah	E. H. Beckstrand	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Required and Elective in Mech. Engr. Course	
University of Washington	Seattle, Wash.	E. O. Eastwood	Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Required and Elective in Mech. Engr. Course	Satisfactory Standing in College of Engineering
CANADA							
Montreal Technical School	Montreal, Quebec		Day	Regular Tuition	Heating, Ventilating, Air Conditioning	Regular Technical Course	Evening School—Primary Grade Education Day School—Two years High School plus entrance education
Nova Scotia Technical College	Halifax, Nova Scotia		Day	Regular Tuition	Heating, Ventilating		
University of Manitoba	Winnipeg, Manitoba		Day	Regular Tuition	Heating, Ventilating, Air Conditioning	Course for Architectural Students	Junior or Senior Standing in College
University of Toronto	Toronto, Ontario		Day	Regular Tuition	Basic Thermodynamics, Heating, Ventilating, Air Conditioning	Presented in Mech. Engr. Course	Junior or Senior Standing in Mech. Engr.



1937 PROSPECTS
WILL *Demand* THESE FEATURES

- Stainless Steel Combustion Dome
- Divided Flue Construction
- Overhead Blowers
- Washers and Filters Within Casing
- Cooling Coils Within Casing
- Counterflow Preheated Air

Dailaire HAS THEM ALL!

Dailaire USERS *Stay* SOLD!

Dailaire systems have a background of six successful heating seasons during which they have given unflinching satisfaction with installations ranging from small homes to large buildings and in a wide variety of climates. Users are boosters and Mr. Dealer that is just the reason why you'll profit with Dailaire during 1937 and the years to come.

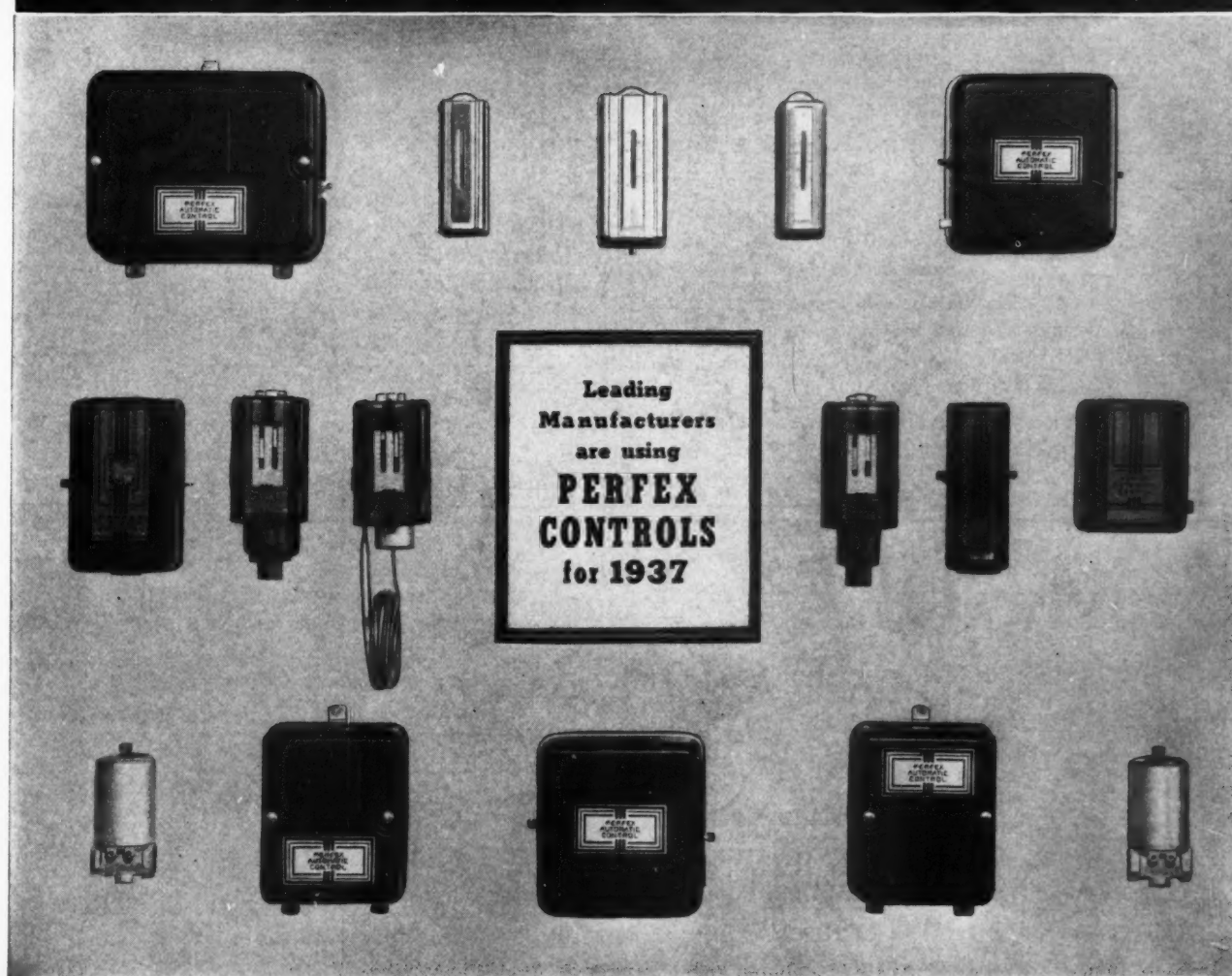
Manufactured by
DAIL STEEL PRODUCTS COMPANY
LANSING, MICHIGAN

WHY WE ARE *Choosely* IN SELECTING DEALERS

Air conditioning is not an "overnight" development; it requires sound engineering and years of field testing. Cobbled up systems will only invite future trouble. Dailaire is a "unit" engineered to do this specialized job correctly. We believe that the best interests of the industry can be served only by a policy of careful dealer selection. The manufacturers of Dailaire have kept engineering abreast of sales and offers to its dealer organization valuable assistance on engineering fundamentals for proper installations. Write us today and get the facts about the field-tested, time-proven Dailaire system.

PERFEX

AUTOMATIC CONTROLS



Perfex offers you a new source of supply of automatic controls for heating, air conditioning and refrigeration. It will pay you to investigate them.

These room thermostats, limit controls, oil burner and stoker combustion controls, relays and solenoid valves, designed and built by an ex-

perienced engineering organization, set entirely new standards in the industry.

Due to their outstanding appearance, their simplicity of design, their ease of installation and their reasonable price, these Perfex controls will appeal to you immediately.

Write for your copy of the Perfex catalog today.

PERFEX CONTROLS COMPANY • 415 W. Oklahoma Place • Milwaukee, Wis.

THE BEST ENGINEERED CONTROLS IN THE INDUSTRY

Where's That Prospect

(Continued from page 105)

waste it?

But on the successful call—what are you going to accomplish? What do you want to do?

The answer is simple. Get *all* the information; it is the foundation of your preparation and presentation. Remember—now you are only “discovering” your prospect. You want to gather ammunition for the sale.

Suggested Census Form

Make your census complete. Here is a simple form and a good one that has been tested. If you obtain all information on it your chances of obtaining an order are trebled.

Later, we shall see why this data is important and how to base appeals upon it. That it is important is attested by the fact that almost without exception national selling organizations of all kinds drill it into their sales forces.

You, too, must train your sales force and yourself. Train to discover that great market. To find which houses have a dollar sign of profit as well as the word “Welcome” on the doormat for you.

The next subject in this series of sales articles will be “Preparing for the Sale and Making the Presentation.”

CLASSES OF INFORMATION

1. Personal or Family
2. Attitude toward Automatic Heating (Air Conditioning).
3. Financial
4. Heating Survey

PERSONAL INFORMATION

1. Name and address
2. Approximate ages.
3. Number of children
4. Owner or renter
5. Elderly people
6. Invalids
7. Hobbies
8. Social activities
9. Servants
10. Who does laundry
11. Church and lodge
12. Furnishings
13. Husband's employer or business
14. Attitude or familiarity toward you
15. Trades people

MAUREY ^{STEEL}_{—V—} PULLEYS

...ARE YOUR INSURANCE AGAINST
BREAKDOWNS!

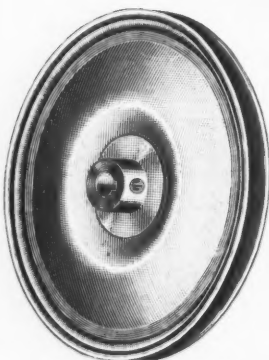
A Maurey Pulley on your equipment automatically insures it against troublesome, costly pulley breakdowns.

Maurey Pulleys are made of only heavy gauge, cold rolled steel, never loosen or pull apart and NO DIE CAST HUBS are used in their construction.

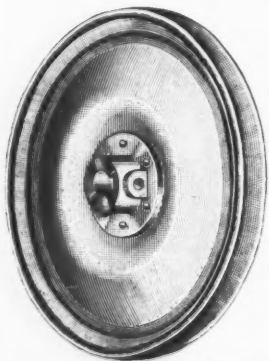
There are types and sizes of Maurey Pulleys for every requirement. Include them in your specifications and remove all your pulley worries.

Write now for free literature.

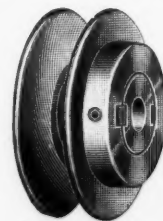
MAUREY MFG. CORP.
29TH—WABASH CHICAGO



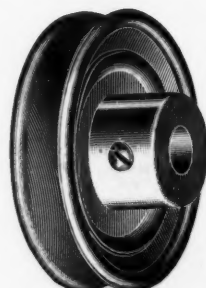
Type 3 with Steel Hub



Type 4 with Malleable riveted Hub



Variable pitch

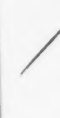
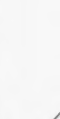


Type 3



1937

ondi-





Trane PRODUCTS

BULLETIN NO. 290



THE TRANE COMPANY — LA CROSSE, WISCONSIN

Manufacturers of HEATING, COOLING and AIR CONDITIONING EQUIPMENT

In Canada, Mowat & King Streets, W., Toronto, Ontario

VALUABLE TRANE BULLETINS

HEATING COILS
COOLING COILS
AIR CONDITIONERS
CLIMATE CHANGERS

RAILWAY AIR CONDITIONERS
PRODUCT COOLERS
EVAPORATIVE CONDENSERS
PUMPS

UNIT HEATERS
CONVECTORS
UNIT VENTILATORS
HEATING SPECIALTIES

A Complete Line of HEATING — COOLING — AIR CONDITIONING

THE COMPLETE TRANE LINE

Trane Products — Bulletin 290.

A brief, concise description of each Trane product. Range of sizes and capacities. Summary of Trane position in Heating, Cooling, and Air Conditioning Field.

EXTENDED SURFACE HEATING COILS

Standard Type "E" — Bulletin 152. Welded Header for High Pressures — Bulletin 162.

Complete performance and installation data. Sample problems for proper selection. Explanation of construction. Capacities. Roughing-in dimensions. Acknowledged as most complete and authoritative information on coil selection.

CONVECTORS — Modern Successor to Cast Iron Radiator.

Bulletin 110. Also eighteen pages of data.

Easily understood description of convected heat with instant and thorough warmth — great economies. Capacities in B.T.U. and E.D.R. Roughing-in dimensions. Piping connections. Hundreds of interesting installations listed and illustrated.

UNIT HEATERS

Propeller type. Cradle Coil model — Bulletin 85.

Description of fifteen great features including Cradle Coil and Floor Line Spread. Methods of installation for best results. Performance and capacity data on largest range of sizes commercially available. Roughing-in dimensions. Brief description of De Luxe and Recirculating models.

Blower type. Torridor model — Bulletin 75.

Unbiased explanation of where blower units best used. How to select. Location of units. Explains Multiflector feature for efficient distribution of air. Capacity and performance data. Roughing-in dimensions.

HUMIDIFIERS

Trane Cabinet Humidifier — Bulletin 125.

Why correct humidity is essential. Simplified construction. How installed easily on any heating system. Humidifying and heating capacity. Roughing-in dimensions.

UNIT VENTILATORS

Trane System of Schoolroom Air Conditioning with Air-O-Lizers and Air-O-Vents. Bulletin 65. Also forty-two pages of data.

Why a complete system. Explanation of modern control cycles for Air-O-Lizer and

Air-O-Vent. Description of Air-O-Vector — auxiliary heater. Complete capacities. Applications. Roughing-in dimensions.

HEATING SPECIALTIES

Ten-page data bulletin.

Description of complete line, including radiator traps, packless radiator valves, vent valves, float and thermostatic traps, strainers, boiler specialties. Capacities. Roughing-in dimensions. Basic engineering principles for vapor system.

Temperature Control Valve — Special Data.

EXTENDED SURFACE COOLING COILS

Water Cooling Coils — Bulletin 182.

Description of encased Type "E" and non-encased Type "C." Complete performance data. Sample problem for proper selection. Explanation of patented features and superior construction. Capacities. Roughing-in dimensions.

Direct Expansion Cooling Coils — Bulletin 172.

Complete performance data. Sample problem for proper selection. Explanation of patented features and superior construction. Capacities. Roughing-in dimensions.

PUMPS

Bulletin 33.

Construction and performance of Pumps for heating or air conditioning systems. Capacities. Dimensions.

A SIMPLIFIED METHOD OF FIGURING RADIATION

Bulletin 102.

How to figure radiation without aid of tables. Practical example.

AIR CONDITIONERS

Trane Systems of Heating and Air Conditioning for the Modern Home — Bulletin B212.

Climate Changer System — Airite System — Dual System — Orifice Convactor System — Vapor Convactor System. Where best applied. Units involved. Performance available.

De Luxe Models, Commercial Units, Unit Coolers — Bulletin 40. Technical Data, pages 1-70.

Various types of Trane Air Conditioners and special advantages for every application. Explanation of unit selection. Complete capacities. Roughing-in dimensions.

Climate Changer — Bulletin 230.

Method of accomplishing year round air conditioning in residences and small buildings with steam and hot water heating and cold water or refrigerant cooling. Where best applied. How installed. Capacities. Dimensions.

Airite — Bulletin 227.

How complete unit provides year round air conditioning with direct-fired, oil heat and cold water or refrigerant cooling. Operation cycles. Easy method of installation. Capacities. Dimensions.

Evaporative Condenser — Bulletin 42. Data 1-16.

How water and power costs are reduced on refrigeration system. Explanation of operation. Dimensions and capacities. Construction details. Method of connection to compressor.

Product Cooler — Bulletin 25.

How forced, low temperature air circulation is provided inexpensively in storerooms. Explanation of superior temperature control. Specifications. Capacities. Roughing-in dimensions.

EVR Condenser — Bulletin 307R.

Explanation of operation that increases capacity of railway refrigerating plants by 25 to 30%. Principle of operation. Construction features.

Special data on Sub-Cooler with performance similar to EVR Condenser.

THE TRANE COMPANY, LA CROSSE, WISCONSIN

PRINCIPAL U. S. BRANCHES

Albany, New York
Altoona, Pennsylvania
Atlanta, Georgia
Baltimore, Maryland
Birmingham, Alabama
Boston, Massachusetts
Brooklyn, New York
Buffalo, New York
Canton, Ohio

Chicago, Illinois
Cincinnati, Ohio
Clarksburg, West Virginia
Cleveland, Ohio
Columbus, Ohio
Dallas, Texas
Davenport, Iowa
Delanco, New Jersey
Des Moines, Iowa

Detroit, Michigan
Findlay, Ohio
Flint, Michigan
Gainesville, Florida
Greensboro, North Carolina
Harrisburg, Pennsylvania
Houston, Texas
Indianapolis, Indiana
Jackson, Mississippi
Juncos, Alaska

Kalamazoo, Michigan
Kansas City, Missouri
La Crosse, Wisconsin
Little Rock, Arkansas
Los Angeles, California
Louisville, Kentucky
McKeesport, Pennsylvania
Memphis, Tennessee
Milwaukee, Wisconsin
Missoula, Montana

Newark, New Jersey
New Haven, Connecticut
New Orleans, Louisiana
New York, New York
Norwich, Connecticut
Oklahoma City, Oklahoma
Omaha, Nebraska
Oshkosh, Wisconsin
Peoria, Illinois
Philadelphia, Pennsylvania

Phoenix, Arizona
Pittsburgh, Pennsylvania
Portland, Oregon
Portsmouth, Ohio
Richmond, Virginia
Rochester, New York
Salt Lake City, Utah
San Francisco, California
Seattle, Washington

Shreveport, Louisiana
St. Paul, Minnesota
St. Louis, Missouri
Syracuse, New York
Washington, D. C.
Westchester, New York
Wilkes-Barre, Pennsylvania
Mexico, D. F.

In Canada: TRANE COMPANY OF CANADA, Ltd., Mowat & King Sts., W., TORONTO, ONTARIO

Price Per Opening

(Continued from page 107)

has been taken originally on a cost plus basis. In this case the correct selling price is passed on to the book-keeping department for billing.

Mr. Feiner says that his overhead on direct labor is figured as 100 per cent. Fifteen per cent is added to the materials cost for waste and overhead. Then 10 per cent is added to the total thus arrived at for profit. The grand total of the collective costs should be and usually is their selling price.

Using Both Methods as Checks

Many sheet metal contractors use both price per opening and metal and labor cost total as checks against each other when figuring air conditioning work. At least one contractor known to be doing this is Metcalf Bros., of Rockville Center, N. Y. Edwin Metcalf, of this company, discussing the two methods, observed that weight of material may depend on how fancy a job is, whether leaders are to be 24 gauge and risers 28 gauge or whether risers also are to be 24 gauge. Competition is important in determining metal gauge and, therefore, weight. If customers desire lasting work and are willing to pay for it 26 gauge for risers is likely to be in force. If cheapness alone is important leaders are likely to be 26 gauge and risers 28 gauge. Factors like these make figuring difficult to reduce to rule, declares Mr. Metcalf.

The Metcalf cost per opening usually runs to \$20.00, states Mr. Metcalf, while 35c per pound of metal is the customary basis when estimating this way. If metal gauge is to be heavy, price per opening usually runs to \$25.00.

A determining factor in air conditioning estimating, further asserts this contractor, is whether the job is to be installed in a new or an old building. When in old buildings labor is far greater, hence cost higher, than when installations are in new construction. More wall cutting, jutting beams to be cut or encompassed, redecorating around grilles, may be high. If owners wish leaders painted this adds to cost, as also does insulation of either leaders or risers or both.

Past experience alone can permit air conditioning estimates on price per opening, declared Metcalf, who further explained that their first dozen or so jobs were estimated on true costs and subsequent ones have tended to be on a per opening basis unless there were special features. Installations in existing structures are known in the Metcalf area as "tailor-made" jobs, as against what some call "mass production" on new developments. When estimates are on material and labor basis, 20 per cent is added for overhead and profit, with metal figured at 35c per pound.

"We Scale Everything," E. J. Decker

The Automatic Burner Co., of Union City, N. J., of which Emil J. Decker is president, scale all air condi-

CONSTANT IMPROVEMENT

by WAGNER
has resulted in

Quieter
Air Conditioner
Motors

WAGNER has furnished motors for air conditioning equipment for many years and has continuously improved motors for this purpose. Among the outstanding features of Wagner motors are: (1) QUIET OPERATION, (2) special operating characteristics to meet this exacting service, (3) long life, and (4) attractive appearance. As a result of Wagner's many years of experience in building motors for air conditioning equipment, Wagner motors are leaders in this field.

A few of the points of superiority of Wagner squirrel-cage motors are:

1. Rotor is of the cast-aluminum type, with bars, end-rings and blowers cast integrally, effecting a one-piece rotor exceptionally sturdy and long-lived. Skewed closed rotor slots minimize magnetic pulsations across the air gap and produce uniform starting torque at different positions of the rotor.

2. The frame and end-plates are strong and rigid, and accurately machined—assuring permanent alignment of bearings and uniform air gap, two essentials for quiet operation.

3. Blowers furnished on both ends of the rotor and many large openings in the stator frame insure thoro and unrestricted ventilation.

4. Stator windings are given a superior winding treatment which provides an insulating surface that is oil and moisture resisting and can be easily cleaned.

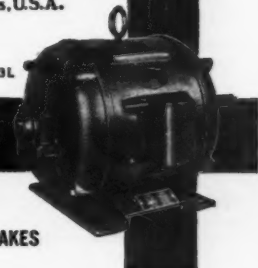
5. Stator and rotor laminations are punched from annealed, non-aging, high-grade electric sheet-steel selected for its magnetic properties.

Many other features of Wagner motors are worth investigating. Write today for Bulletin 182 which describes the Wagner motors that are Second-to-None for air conditioning.

Wagner Electric Corporation
6400 Plymouth Avenue, Saint Louis, U.S.A.

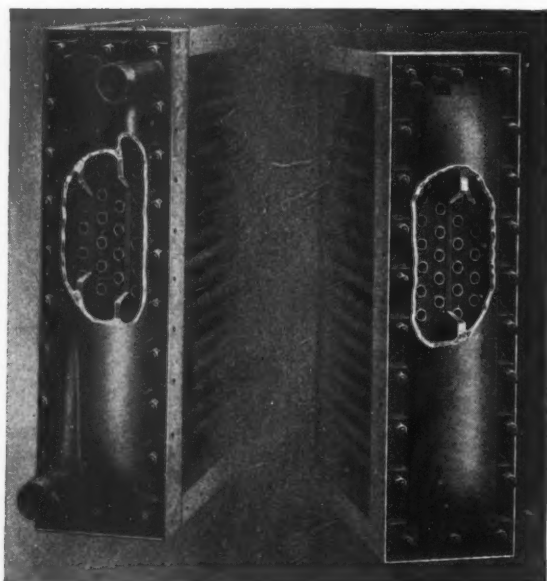
ML 236-3L

MOTORS • TRANSFORMERS • FANS • BRAKES



NOW CLEANABLE TUBE AEROFIN

With Removable Headers
Simplifies Cleaning of
Tube Interior



LEFT: Water connection end of unit showing baffles for 18-tube single pass. For 36 tubes double pass, center baffles only used. RIGHT: Rear end for 18-tube single pass. For 36 tubes double pass, baffle omitted.

Aerofin Cleanable Tube units, for heating and cooling with water, have been designed for use where the prevalence of sediment or scale-forming chemicals in the water, makes periodic cleaning necessary.

Now, by the simple removal of a few bolts, both end headers may be disengaged, exposing the ends of all tubes.

Headers are designed so that water may be circulated in single or double passes (18 or 36 tubes in parallel) making possible the use of large quantities of water with small head loss. Send for descriptive folder.



AEROFIN CORPORATION

850 Frelinghuysen Avenue
Newark N.J.

Chicago Detroit New York Philadelphia

tioning work before making estimates and then figure on the cost or material plus labor basis. To do otherwise is extremely hazardous, in the opinion of Mr. Decker. This company splits its business rather evenly between mechanical stokers and air conditioning, selling about 100 conditioning jobs annually. Were the Automatic company to estimate on a price per opening basis, asserts Mr. Decker, it would ask \$25.00. They have tried lower figures and have not earned a profit. They make their own sheet metal pieces and employ an installation crew.

From Low to High Prices

Automatic's experience is to the effect that when they first sold conditioning they estimated as low as \$15.00 per opening, later raising to \$18.00, later to \$20.00 and now price such work at \$25.00 per opening. Mr. Decker cites the point that labor cost usually is double the cost of the metal, hangers, dampers, grilles and other material. For every hundred dollar job estimated, material costs about \$35.00 and labor \$65.00. Metal and labor cost per opening, he states, are about \$18.00 and, if one is to cover overhead and profit, he must add about \$7.00, to bring the total to \$25.00 per opening for both supply and return lines.

"Per Opening Is Fallacious," A. Brassington

Estimating on a per opening basis is entirely fallacious, in the opinion of Arthur Brassington, New York City sheet metal and ventilating contractor for the last 35 years. On large jobs, say involving some 100 residences in a single development, the per opening method can be used, he believes. But on isolated jobs, particularly in existing structures, with numerous turns, extra cutting, wall decoration about grilles, only cost of metal and labor, plus overhead and profit, can be employed. Cost per pound of metal may be as fallacious as per opening, he points out, because, although ducts may be small, they may be long, often to third floors; turns may be as many as five to a single supply line. Obviously the total cost per opening, if thus estimated, would not be the same as when a single floor must be conditioned, buildings are new, builders have left openings for ducts and grilles, runs are short and direct. The differences between the two sets of conditions might easily make the one price twice that of the other when estimated on the per opening plan, while the same might be true with the opposing method.

Conclusions

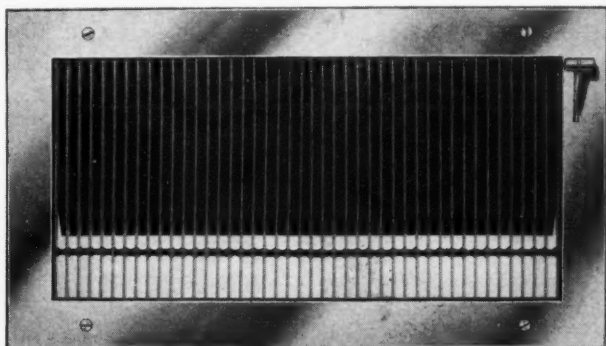
Boiling down the foregoing it might be said—

- 1—All jobs should be scaled unless duplicates.
- 2—Per opening and per pound bases of figuring can be used as checks.
- 3—Short-cut estimating methods are dangerous.
- 4—Add a generous safety factor, say 25%, to totals arrived at by either of the two methods.
- 5—It's better not to take orders at a loss than to gamble on faith or with the idea of "skinning" to come within erroneous estimates.

THE AIRLINE REGISTER

Free Area 74% . . . Effective Area 87%

Modern in design, the Airline Register is attractive in appearance. Created especially for Air Conditioning work. It is sturdily built, is easily painted on the job, and provides a high percentage of effective area.

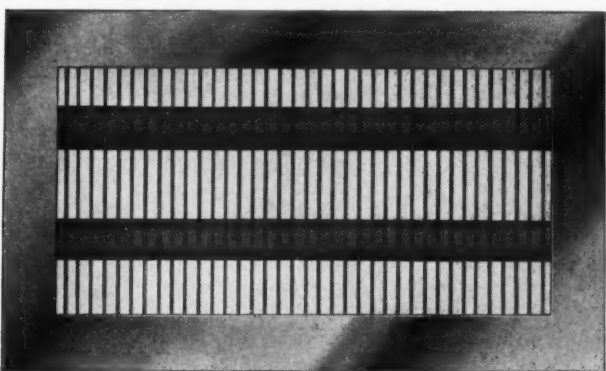


Airline Reg.

Special attention is called to the attractive side operator of the damper which allows the face design to be continuous. The face bars may be set to provide **fixed air deflection**.

COMBINATION HORIZONTAL AND VERTICAL AIR DEFLECTION

Now available, **all in the same unit** combination horizontal and vertical air deflection.



*Airline Grille
Combination Horizontal and Vertical Deflection*

Front grille bars furnished vertical with horizontal adjustable back blades or horizontal grille bars with vertical back blades. With the Flexair grille this construction allows for all of the adjustment right at the outlet.

WRITE FOR LITERATURE

A new Tuttle & Bailey catalog has just been issued on their complete line of air conditioning grilles, registers, etc.—write for your copy

Tuttle & Bailey, Inc.
New Britain, Conn.

New York — Chicago
Boston — Philadelphia

*Yes sir—we want
a MAN in your
town . . . to sell*

U.S. AircO
AIR CONDITIONING SYSTEMS

Here's what we have to Offer:

A complete line of air conditioning systems in all sizes.

Systems of all types—plain ventilation, washed air, cold water, refrigeration. Low cost "unit systems" ready to install for small stores, offices, restaurants, cafes, bars, beauty parlors, etc. Low priced room cooling units for homes and offices.

The U. S. AircO line is proven by years of experience and thousands of systems in use.

*Are YOU the man
we want?*

Here's the kind of a man we want:

A man who wants to develop his warm air heating business into a real air conditioning business. A man who realizes the tremendous volume of air conditioning that is coming in the small commercial field. A man who wants an exclusive agency for a complete line that will make him "air conditioning headquarters" in his community.

**Write us today if you think
you are the man**

U. S. AIR CONDITIONING CORPORATION

2105 Kennedy St. N.E., Minneapolis, Minn.

Please send information on U. S. AircO Air Conditioning Systems and exclusive dealer franchise.

Name.....

Address.....

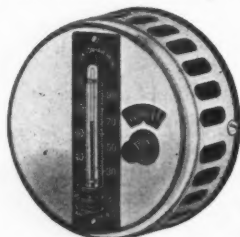
City.....State.....



GLEASON —AVERY

ELECTRIC
TEMPERATURE
REGULATORS
FAN SWITCH
and
LIMIT CONTROL

This compact, reliable instrument is for use as a safety device to prevent over-heated bonnets or as a switch to operate the circulating fan in Forced Warm Air Systems. It can be used in any two or three wire circuit using either high or low voltage current. A snap action single pole double throw double break switch operates between pure silver contacts held firmly together until the instant of breaking. The Fan Switch is quickly installed, attractive, and easily set to the desired temperature.



THERMOSTATS SINGLE and DOUBLE

Gleason-Avery low voltage thermostats are unsurpassed in sensitivity and dependability. The unique design of the base, which permits a

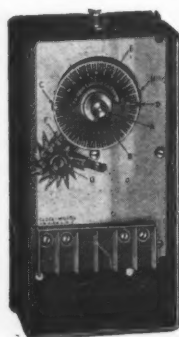
free circulation of air, contributes to its immediate response to temperature changes, making artificial influences unnecessary.

Each instrument is tested and calibrated before leaving the factory, but can be easily adjusted in the field by a simple nut adjustment.

Incorporating the same principles of design employed in the construction of the Single Thermostat, the Dual Thermostat gives the added comfort and economy of an automatically lowered night time temperature.

AUTOMATIC TIME SWITCHES

FOR FURNACE FAN OR ATTIC
FAN AND FOR NIGHT AIR
COOLING



In all installations where it is desired to maintain different day and night temperature levels, a time switch must be used. Our Synchronous Electric Time Switch is accurate, dependable, and particularly designed to operate in connection with Gleason-Avery

Dual Thermostats (though it has been used in other ways). The time mechanism is of first quality and is easily set to operate the switch at the desired hours. It is self-starting. Complete instructions for mounting and wiring are placed inside the case. An Accessible terminal block is provided for all wire connections.

A postcard will bring further information.

GLEASON-AVERY, INC.

Auburn

New York

Konzo Individual Duct Systems

(Continued from page 110)

(6) In an individual duct system of this nature it is essential that the temperature of the air in the bonnet should be uniform at all points in the bonnet. Other-

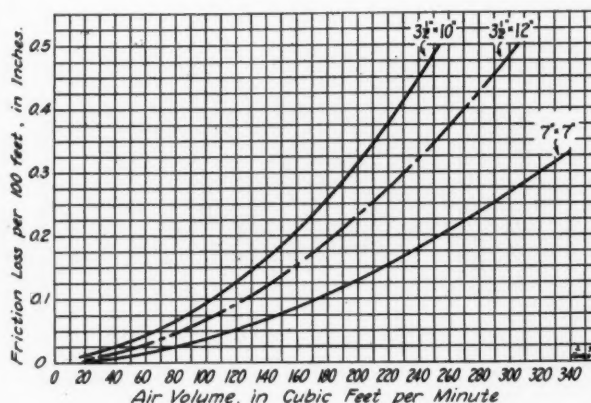


Fig. 3—Friction loss for 100 feet of standard sized ducts.

wise, the actual air volume requirements for the different rooms will be different from the calculated requirements, which were based on a uniform bonnet temperature. This requires careful baffling of the furnace and good mixing of the circulating air as it leaves the heating surfaces.

Use of Other Standardized Sizes

The method described is by no means confined to the 7 in. x 7 in. duct, since the principle can be applied to any size of duct that a given manufacturer may

TABLE 3

Capacity and Friction Loss of
3 1/2 in. x 12 in. duct

Duct area = 42 sq. in. = 0.292 sq. ft.
Equivalent diameter = 6.8 in.

1	2	3
Velocity ft. per min.	Friction Loss per 100 ft., in.	Air vol. handled cu. ft. per min.
100	0.02	29
200	0.03	58
300	0.05	87
350	0.07	102
400	0.09	117
450	0.11	131
500	0.13	146
550	0.15	160
600	0.17	175
650	0.21	190
700	0.24	204
750	0.28	219
800	0.30	233
850	0.33	248
900	0.37	262
950	0.41	277
1000	0.46	292

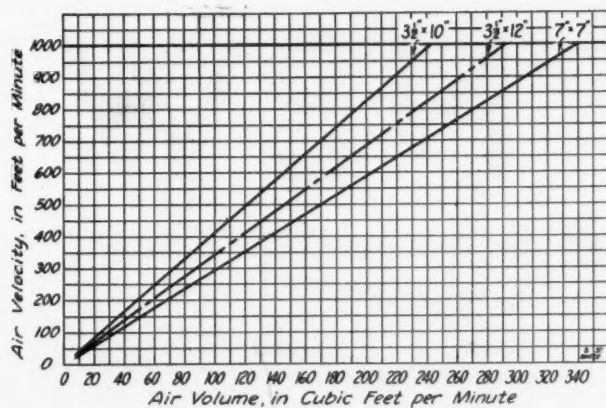


Fig. 2—Air velocities in three standard sized ducts.

decide upon. As a matter of fact, since the 7 in. \times 7 in. duct cannot be used as a wall stack, the use of rectangular stacks has been recommended by some manufacturers. The values listed in Table 3 are for a duct 3 1/2 in. \times 12 in., and the values listed in Table 4 are for a 3 1/2 in. \times 10 in. duct. These smaller stacks may be used from the bonnet to the register without the use of transition pieces or special fittings. (Fig. 1.)

For the convenience of those who prefer a graphical relationship, the values listed in Tables 2, 3, and 4 have been plotted in curve form as shown in Figs. 2 and 3. Similar tables and curves can be made for any other size of pipe. Table 5 shows the calculation procedure based on the use of 3 1/2 in. \times 12 in. ducts.

It should be noted that in the case of these small ducts a large portion of the total pressure loss of the duct may occur at the junction of the bonnet and the duct. Some of the difficulties experienced in the field with individual duct systems are probably caused by the excess resistance to air flow which result from

TABLE 4

Capacity and Friction Loss of
3 1/2 in. \times 10 in. duct

Duct area = 35 sq. in. = 0.243 sq. ft.
Equivalent diameter = 6.3 in.

1	2	3
Velocity ft. per min.	Friction Loss per 100 ft., in.	Air vol. handled cu. ft. per min.
100	0.02	24
200	0.03	49
300	0.05	73
350	0.07	85
400	0.09	97
450	0.11	109
500	0.13	121
550	0.15	134
600	0.18	146
650	0.20	158
700	0.23	170
750	0.27	182
800	0.30	194
850	0.33	207
900	0.37	219
950	0.41	231
1000	0.46	243

AUTOVENT

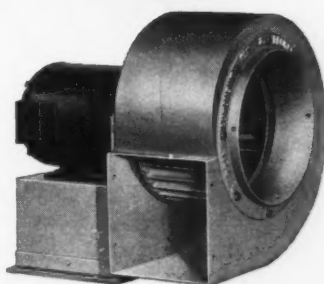
The Complete Line

*AUTOVENT presents a complete line of tried and proven equipment for the air conditioning, warm air heating and sheet metal market, backed by 25 years' experience.



AUTOVENT
"31" Series
PROPELLER FANS

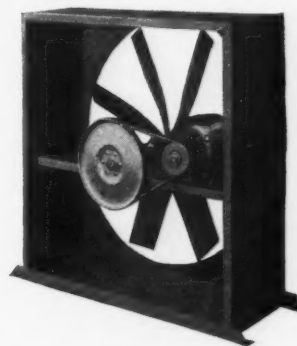
An exclusive Autovent designed unit which will not churn air or overload the motor. Especially recommended for economical ventilation, where greatest volume of air delivery is required at lowest cost. Ruggedly constructed for indefinite operation under severe conditions. Capacities from 500 to 38,000 CFM.



AUTOVENT,
UNIBLADE
VOLUME
BLOWERS

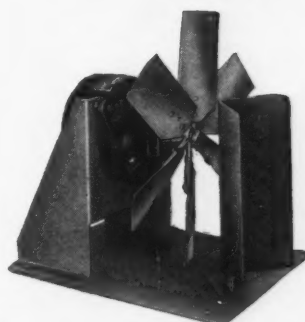
Motor driven—universal discharge, for fume hoods, kitchen hoods, chemical labs, processing, drying, forced draft, etc., handles low volumes of air at medium pressures. Wheels from 8" to 11" dia.—same design as heavy duty blowers. Can be mounted on floor, wall or ceiling. Direct Connected Blowers for other applications available in wheels up to 25". Write for Bulletin No. 300.

Uniblade Forward Curve and Non-overloading backwardly curved belt-driven centrifugal blowers in single and double widths with 12 1/4" to 75" wheel diameters, available for all types of ventilating and air conditioning installations. Complete performance tables with dimension sheets of various rotations and discharge will be sent with Bulletins 301 and 302.



AUTOVENT
COOLVENT FAN
FOR ATTIC
VENTILATION

A practical, low priced summer ventilating and cooling system. Forces hot, stagnant air from attic space, draws in cool, fresh air. Capacities 2200 to 9000 CFM. Quiet operation! Write for Bulletin No. 204.



AUTOVENT
FURNACE
BOOSTER FAN

A compact unit for use in warm air gravity systems which are not operating satisfactorily. Provides forced circulation of air through the complete heating system eliminating cold rooms, or cold air pockets in room. In hot summer months it acts as a cool air booster—a pleasant, cooling effect being attained by turning on Furnace Booster Fan which draws cooled air up from the basement and circulates it throughout the home. Write for Bulletin No. 203.

Autovent Engineers will gladly assist in the selection of equipment best suited to specific requirements. INVESTIGATE—WRITE FOR BULLETIN TODAY!

AUTOVENT FAN & BLOWER CO.
1807-19 NORTH KOSTNER AVENUE
CHICAGO, ILLINOIS



FANS • BLOWERS • UNIT HEATERS



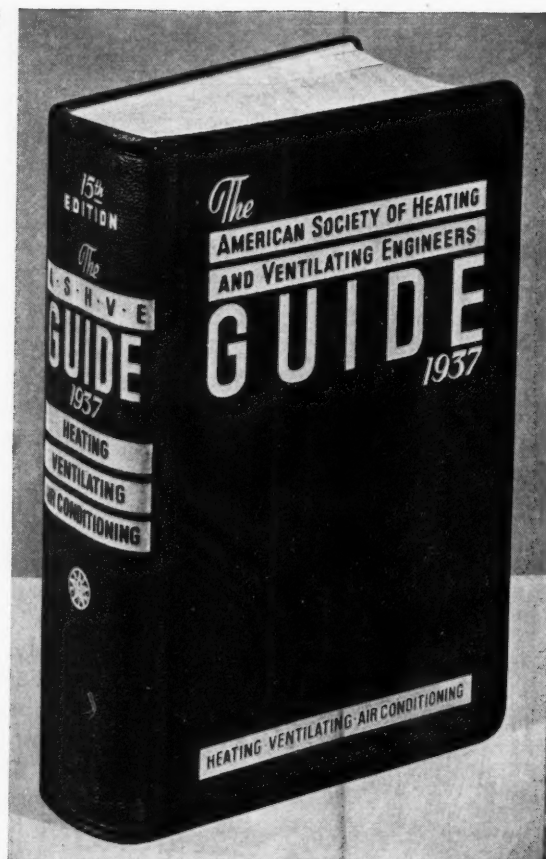
NEW!

READY
January 25th
1937

THE new 1937 Edition of the A. S. H. V. E. Guide will soon be off the press.

Thoroughly revised and brought up-to-date this big 1937 Edition will contain 44 chapters of practical usable information—many more pages than last year.

Under the supervision of the Guide Publication Committee the entire book has been checked, revised and brought right up to the minute. New material and new illustrations have been added. Nowhere else can such a wealth of authoritative information on the subjects of heating, ventilating and air conditioning be obtained. Place your order now for this 12 months' engineering service that is always on hand ready to give the right answer to your problems.



Contents of the A. S. H. V. E. GUIDE 1937

- | CHAPTERS | CHAPTERS |
|---|---|
| 1. Air, Water and Steam | 23. Gravity Warm Air Furnace Systems |
| 2. Refrigeration | 24. Mechanical Warm Air Furnace Systems |
| 3. Physical and Physiological Principles of Air Conditioning | 25. Boilers |
| 4. Natural Ventilation | 26. Chimneys and Draft Calculations |
| 5. Heat Transmission Coefficients and Tables | 27. Fuels and Combustion |
| 6. Air Leakage | 28. Automatic Fuel Burning Equipment |
| 7. Heating Load | 29. Heat and Fuel Utilization |
| 8. Cooling Load | 30. Radiators and Gravity Convectors |
| 9. Central Systems for Heating and Humidifying | 31. Steam Heating Systems |
| 10. Central Systems for Cooling and Dehumidifying | 32. Piping for Steam Heating Systems |
| 11. Cooling Methods | 33. Hot Water Heating Systems and Piping |
| 12. Humidification, Dehumidification and Water Cooling Equipment | 34. Pipe, Fittings, Welding |
| 13. Unit Heaters, Ventilators, Air Conditioning and Cooling Units | 35. Water Supply Piping and Water Heating |
| 14. Automatic Control | 36. Insulation of Piping |
| 15. Air Pollution | 37. District Heating |
| 16. Air Cleaning Devices | 38. Radiant Heating |
| 17. Fans | 39. Electrical Heating |
| 18. Sound Control | 40. Air Conditioning for Industrial Processes |
| 19. Air Distribution | 41. Drying Systems |
| 20. Air Duct Design | 42. Electric Motors and Controls |
| 21. Industrial Exhaust Systems | 43. Test Methods and Instruments |
| 22. Railway Air Conditioning | 44. Terminology |

SINGLE COPIES \$5.00

MAIL TODAY

TO make certain of receiving your copy of the new A. S. H. V. E. Guide 1937 fill out and mail the attached coupon together with check or money order for \$5.00.

The new Guide will contain over 1150 pages consisting of 44 chapters of revised text pages and 280 pages of Manufacturers' Catalog Data. 6 x 9 in.—New Blue Flexible Binding.

Because of the up-to-date nature of the material contained in The Guide 1937, it is indispensable to engineers, architects, contractors, students and others engaged in heating, ventilating or air conditioning.

The 1936 Edition was completely exhausted some months ago—make sure of your copy of the 1937 Edition—order today.

ORDER BLANK

AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS

51 MADISON AVE., NEW YORK, N. Y.

Enclosed is \$5.00 for which send me as soon as ready a copy of the A. S. H. V. E. Guide 1937. It is understood I may return it within 10 days, if it is not satisfactory and you will refund my remittance.

Name
Position
Firm
Address
City and State HP

REMITTANCE MUST ACCOMPANY ORDER

sharp openings, rough joints, and constrictions at the opening. Especial attention should be directed to this junction point and suitable transition pieces should be provided to allow the air to flow freely into each duct. See Fig. 4. In this connection the installer should also plan the duct installation so that there will be a

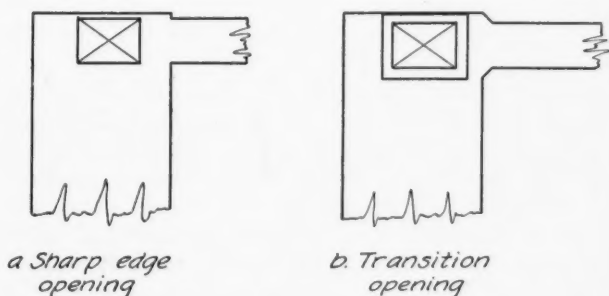


Fig. 4—Transition type openings in bonnet reduce the pressure loss in the duct system. (See text for explanation.)

minimum number of turns and elbows in the ducts, particularly in those ducts in which the calculations indicate that the pressure loss will be large.

Kroeker—Heating Costs

(Continued from page 127)

HEATING VALUES OF GAS, BTU PER CUBIC FOOT	
Manufactured gas	
Coal gas	634
Coke Oven gas	536
.....	600
Blue water gas.....	310
Carburetted water gas.....	578
Oil gas	516
Natural gas	
Arkansas	1000
California	1053
Illinois	1505
Indiana	984
Kansas	988
Kentucky	1139
Louisiana	973
Missouri, Jasper	1008
New York, Allegany.....	1264
..... Genesee	1045
Ohio, Erie	1062
Oklahoma, Nowata	959
..... Washington	1064
Pennsylvania, Blair	1065
..... McKean	1505
Texas, Novarro	988
..... Tarrant	698
West Virginia, Marion.....	1126

HEATING VALUES OF WOOD, BTU PER CORD	
Ash	20,400,000
Beech	20,900,000
Birch	20,900,000
Chestnut	15,600,000
Elm	17,700,000
Hickory	24,800,000
Oak	23,900,000
Pine, yellow	22,000,000
..... white	14,200,000
Spruce, Engleman	13,280,000
..... Sitka	14,900,000
Fir, White	14,250,000
..... Noble	15,300,000
..... Douglass	17,850,000
Yew	24,550,000

— FOR LEADERSHIP
LOOK TO THE LEADER

25^{year}
GUARANTEE

A 25 Year Guarantee now applies to all Rudy Coal, Oil and Gas Air Conditioning Furnaces — the only such guarantee in the industry. Line-up with Rudy in 1937. THE RUDY FURNACE COMPANY, DOWAGIAC, MICHIGAN.

RUDY

EXTRA! EXTRA!

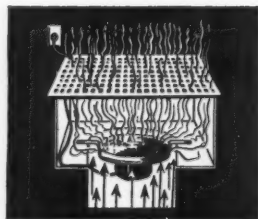


**VICTOR OFFERS
FURNACE MEN
a Heat Booster
Free
WITH AN
ORDER FOR THREE**

**YOUR PROFIT
OVER
50% ON**

VICTOR HEAT BOOSTERS

Actually—you get a \$7.50 Victor Heat Booster absolutely FREE with an order for three—which makes your profit over 50% on the deal. Hurry—act now! This special offer may be withdrawn at any time. Take advantage of this opportunity to get your share of "Extra Profits" for demonstrating Victor Heat Boosters.



GETS HEAT UP QUICK



**FLOOR TYPE
LIST
PRICE \$7.50**



**WALL TYPE
LIST
PRICE \$10.00**

4 out of 5 HOMES Need a Heat Booster

Nearly every furnace heated home has at least one "cold" register that you can cure with a Victor Heat Booster. This sensational invention pulls the cold air cork that holds back the heat and gives you a sweet profit for making rooms warm and cozy. No selling is necessary—just a 5 minute demonstration and they buy it.

Tested and Proved— Results Guaranteed

Victor Heat Boosters have eliminated "refrigerator" rooms in thousands of homes, and earned handsome profits for furnace men. No drilling, cutting or alterations of any kind necessary. Just set in place, plug into an electric outlet and welcome warmth floods the room instantly. Low in price and costs only a few cents a week to use. Pays for itself in fuel savings.

SALES HELPS FREE

A Giant Window Display and attention compelling handbills given to Victor Heat Booster dealers without charge. Don't delay—investigate at once. Clip coupon and mail for full information.

MAIL TODAY—GET \$7.50 Extra Profit

VICTOR ELECTRIC PRODUCTS, INC.
737 Reading Road, Cincinnati, Ohio.

Send immediately information on Victor Heat Boosters and details of your \$7.50 "Extra Profit" Offer.

Name

Address

Town..... State

Buck's Floor Plenum Heating

(Continued from page 102)

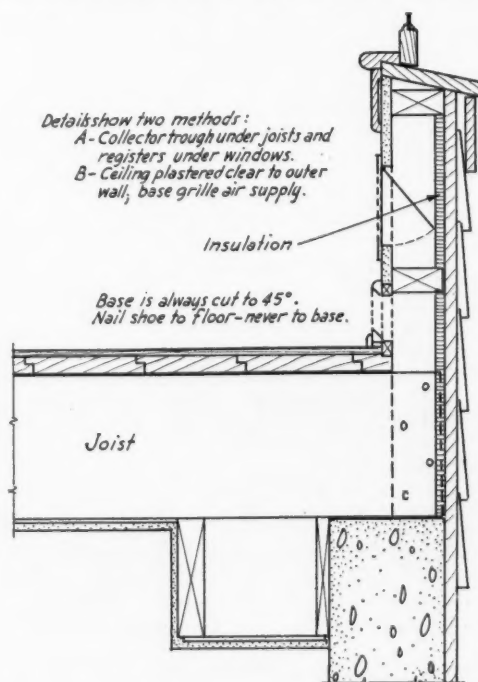
ducts. A half inch insulating board covers the plenum duct and basement ceiling.

Some of the engineering problems which have aroused questions among those visiting the jobs may be interesting to readers.

The quantity of air circulated through the floor plenum is that necessary to deliver the total heat to the room. Obviously, in a thermostatically controlled oil fired job, the air temperature will vary all over the map. Part of the heat will be utilized through the floor; the remainder is still contained in the air as it enters the room. It moves across the room at comfort temperature as set by the room thermostat, to the return air grille to be re-conditioned.

If the floor is a thick one, heavily carpeted, we simply reduce our air quantity while running at the same fuel rate. This increases the air temperature, hence the floor temperature. A well designed conditioner that handles 1,600 cfm can be reduced to 1,200 cfm with but slight loss of efficiency. If the air when handling 1,600 cfm was 150° F. and returned at 60° F., it will rise to 180° F. (almost) when we reduce the air flow to 1,200 cfm.

Some heating men will question this, but years of experience with many direct fired heat exchangers, has shown that all except one or two only pick up 4 or 5 percent of additional heat with the last 25 percent of



Air from the joist space may be introduced through registers under the window sill or through continuous or intermittent baseboard grill faces. This detail shows the construction.

air. Air temperatures need not be stated because a complete range is available to the contractor in almost any actual practical direct-fired installation, so he can get any desired floor temperature at will. Also, he can

ELECTROL *Presents***"PROGRESSIVE" AIR CONDITIONING-***Equipment so designed that the home can be
conditioned completely or step by step . . .*

Whether it is a new home or one in which there is at present a warm air, steam or hot water system, Electrol provides equipment that will enable the owner to condition his home wholly or in part.

Included in Electrol's complete line of oil heating and air conditioning equipment are three units deserving particular attention at this time, when so many people are thinking of air conditioning and are desirous of converting their present systems to this end. These are:

The Electrol DF Series:—a direct oil-fired, fully automatic warm air furnace, guaranteed at 80% efficiency when operated at rated capacity, that also cleans, circulates and humidifies the air.

The Electrol FC Series:—a blower unit which when attached to a warm air system will filter, circulate and humidify the air.

The Electrol SS Series:—a unit to be attached to a steam or hot water system, that will enable the home owner to adapt his present system to air conditioning any part or all of his home. This unit is termed a split system, because it makes possible the filtering, circulating and humidifying of the air in a part of the house, while the rest of the house is heated with the steam or water radiators.

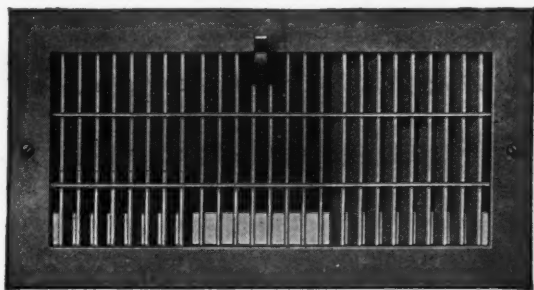
To any of these three units can be readily attached de-humidifying and cooling equipment for summer conditioning, as each unit has sufficient air capacity.

ELECTROL Incorporated**934 MAIN AVENUE, CLIFTON, N. J.**

Write for complete information on Electrol air conditioning equipment, and on the above units in particular.

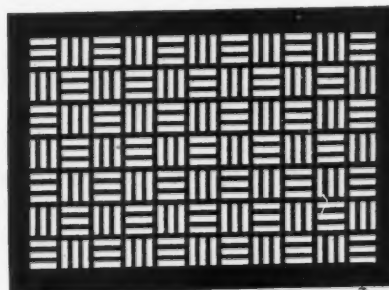
**NEW ERA - NEW IDEAS***Backed by 200 years' experience.***WHAT WILL IT BE GENTLEMEN?**

TIMES ARE CHANGING RAPIDLY IN OUR INDUSTRY. YOU WILL ALWAYS FIND US IN THE FRONT RANK WITH YOU. WE CARRY A LARGE AND VARIED STOCK OF REGISTERS AND GRILLES.



THE STYLE NO. 3320 REGISTER IS THE LATEST DEVELOPMENT IN THE INDUSTRY.

THE REGISTER WHICH ALLOWS THE DIRECTIONAL FLOW OF AIR TO BE ADJUSTED ON THE JOB.



DESIGN NO. 3050A

A MODERN DESIGN MADE IN STAMPED METAL

WRITE FOR OUR COMPLETE CATALOG FEATURING AIR CONDITIONING SPECIALTIES, NEW DESIGNS IN CAST, STAMPED AND FABRICATED METAL AND THE STANDARD PRODUCTS.

REGISTER & GRILLE MFG. CO.**70 BERRY STREET
BROOKLYN, NEW YORK**

JAMES H. BAILEY
President
TROWBRIDGE A. WARNER
Sales Manager
RUSSELL T. BAILEY
Director

INCORPORATED
BRUCE R. TUTTLE
Vice Pres. & Counsel

OFFICERS AND DIRECTORS
CLIFFORD D. BAILEY
Secretary

EDWARD F. BLUM
Director

FRANK T. BAILEY
Vice President
ALFRED L. TUTTLE
Treasurer
ERIC D. MOLLANDER
Director

set his bonnet stat to start the fan only when the air has reached the desired temperature; thus, get the result. The main point is that we need to deliver less total heat, because the comfort temperature is lower. Hence, less fuel is used.

As to installation, in one house, we took off the baseboard, removed all lath and plaster from an inch below the baseboard top down to the floor. It was easy to cut and tightly squeeze in soft insulating board blocking. A good carpenter did this and replaced with air-delivery-base in a few hours; less time than required to fit registers.

Locating Plenum Supplies

With one center supporting beam, run the duct alongside, same depth, and furr both beam and duct. When the duct must run along an outer wall, deliver very little air at that wall, for the warm floor effect in the rooms bounded by that wall will be high, and with cooler air being delivered to rooms on the opposite wall, much more air must enter them if we are to deliver their required total heat. Results are not so good as where we can deliver at the warm wall (into the joist space), and make the air flow clear over to the cold wall.

All the air enters the room at our cold wall side, through our base air delivery fixture.

95° is not a high enough air temperature. We want our floor to reach 95°, and just how much 135 or 185-degree air it will take to do this will depend upon the volume passing through. The volume is obviously

limited by the total heat required by the room, and this total heat is different for nearly every day over the period of, say, a month.

Example of Joist Pipes

Where some arbitrary city ordinance does not permit use of the open joist space for air delivery, run a 4 inch pipe through each joist space. Radiant heat from the pipe warms the floor. Use very cheap, light black pipe, the leakier the better.

Some of our moist air should leak into a wood joist and sub floor construction to insure normal moisture content of the wood, thus preventing shrinkage. This requirement is a practical bar to the use of steam or hot water pipes in wood joist spaces, but when we pour warm, moist air through them, we are merely continuing our normal summer temperature and humidity conditions and no shrinkage occurs if the wood was normal when the floor was constructed.

Let us assume a case of a room requiring 8,000 Btu/hr., the air entering the pipe at 170° and being recirculated at 60° or, in other terms, delivering 2 Btu per cu. ft. Then 4,000 cf. hr. are required.

Assume 12 joist spaces, then our 12 pipes would have a total area of one sq. ft. and the air would thus be moving through at a velocity of 66 ft. per minute. The pipe surface area per linear foot is about one square foot. If the room is 12 feet across, and we are maintaining an average of 135 degrees in the joist space, we then have 12 sq. ft. of pipe losing heat at (170-135) T d. If the floor is such that one third of our total heat is being delivered through it, each joist space is delivering 222 Btu/hr. Then per sq. ft. of black

CHAMBERLIN THE TROUBLE-FREE HUMIDIFIER



**FULLY
AUTOMATIC
ONE PIECE CASTING**

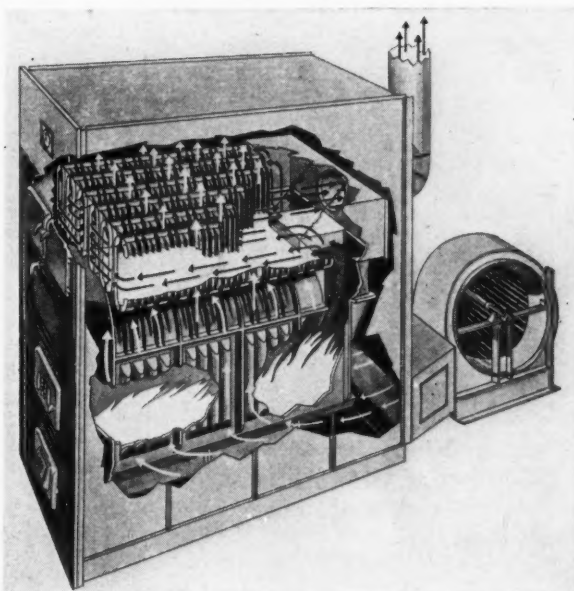
HERE is a Humidifier that was a pioneer in the field 11 years ago and has been successfully manufactured with coast-to-coast popularity during these years. Chamberlin Automatic Humidifiers are cast entirely in one piece; available in cast iron with baked enamel finish, or cast aluminum. A new type valve that is completely out of water eliminates valve trouble. The trap cast integral keeps heated water from circulating into the float pan to cause lime. Vapor

pan is 3" deep, but carries only 1" of water to insure rapid evaporation. The Chamberlin is made in one size only, but fits any furnace hood. Quickly and easily installed. Shipped complete with convenient connector for clamping into water line; copper tubing; out-of-water valve; emergency overflow tube which also serves to support humidifier rigidly in the casing; adjustable plates for leveling pan in any furnace hood. Fully automatic and fully dependable. Prices are attractive to customers and profitable for dealers. Write today for complete literature and prices.

**MANUFACTURED BY
CHANDLER COMPANY CEDAR RAPIDS, IOWA**

The ACME HEATER

"It's in the Fins"



PHYSICAL DATA—LARGE SERIES

Size No.	Dimensions			Grate sq. ft.	Heat Surf. sq. ft.	Free Area sq. ft.		Wt. Lbs.	Max. Capacity Btu.
	Length	Width	Height			Min.	Max.		
7	6'-6"	4'-0"	7'-0"	10.31	260	6.55	10.25	5900	900,000
8	8'-1"	4'-0"	7'-0"	11.91	340	7.73	12.50	7000	1,100,000
9	9'-8"	4'-0"	7'-0"	13.06	430	8.91	14.75	8000	1,300,000
10	11'-3"	4'-0"	7'-0"	14.43	500	15.82	22.62	9300	1,500,000

JUNIOR SERIES

2	4'-6"	3'-6"	5'-8"	3.9	136	4.7	4.7	3200	350,000
3	6'-0"	3'-6"	5'-8"	6.1	183	5.9	6.9	4800	527,000
4	7'-6"	3'-6"	5'-8"	7.2	230	7.1	9.1	5000	634,000
5	9'-0"	3'-6"	5'-8"	9.3	280	8.3	11.3	6000	800,000

Note: For Automatic Firing Add 10% to Ratings Given.

Burns Any Kind of Fuel

The design of an all cast iron, direct transmission heater, such as the Acme, is not dependent upon the kind of fuel to be used. Any type of fuel may be burned. Suitable grates may be provided so that bituminous, semi-bituminous, anthracite coal, or other solids may be used with equal efficiency. Replacement of grates and linings by proper refractory material permits the use of automatic stokers on oil burning equipment.

Large Combustion Chamber

The Acme Heater provides ample space for the ignition of gases of combustion, regardless of the kind of fuel used. The unusually large combustion chamber, acting as "primary" heating surface, effects a very efficient transfer of heat, because of the great temperature difference between the burning gases inside the chamber and the air passing over the outside surface.

Efficient Radiator Section

Although the heating surface of the combustion chamber is large and efficient, still more heat must be extracted to obtain satisfactory overall efficiency. An inspection of the "phantom view" above will reveal how the gases of combustion enter the rear smoke chamber, flow to the front of the heater, and return again to the smoke-box. It is evident that the gases are held in intimate contact with the heating surface, six times the length of the heater, before they are permitted to escape.

High Ratio of Heating Surface to Grate Area

The radiator tubes are covered with extended surfaces, or fins, typical of those used on indirect heating coils. The long, oval tubes of the radiator provide an exceptionally large heating surface and, when combined with the surface of the combustion chamber, afford a remarkably high ratio of heating surface to grate area.

Balanced Construction

The construction of the Acme Heater provides ample free area and allows proper velocity of the air to be heated. Moreover, this air is brought into direct contact with as much heating surface as possible, resulting in the Acme of Efficiency.

ACME HEATING & VENTILATING CO., Inc.
4224 LOWE AVENUE CHICAGO, ILL.

SAY, ED, HAVE YOU SEEN THE 1937 EMERSON ELECTRIC BLOWER CATALOG?

YES, AND IT'S A SWELL LINE OF BLOWERS I'VE USED THEM FOR YEARS. I'M GOING TO SEND FOR MY COPY OF THEIR CATALOG RIGHT NOW.

WRITE FOR YOUR COPY OF THE 1937 EMERSON FURNACE BLOWER CATALOG

WHEN you receive your new Emerson Catalog, you, too, will become enthusiastic about the unusual sales advantages of the new Emerson Furnace Blowers and about the profit advantages of Emerson's new NET PRICE buying plan.

Here are but a few of the superior performance features that give you the edge on competition when you sell Emerson Furnace Blowers:

- 1 Specially-designed, direct-drive, multi-speed, rubber-mounted motors.
- 2 No belts to stretch or to adjust when changing speeds.
- 3 No vibration noises.
- 4 Only two places to lubricate.
- 5 Low-cost operation—servicing expense practically eliminated.
- 6 Eight speeds simplify balancing the heating system to the exact requirements of each installation.
- 7 Attractively finished in red and black.

FREE Emerson Blower Display Stands

Here's a powerful silent salesman that helps you close sales. It is sent free with an order for one No. 17-E Emerson Blower Package Unit. You'll get further details when you send for your new Emerson Furnace Blower Catalog No. A137. Send for your copy today. Delay may mean lost sales and profits.

21

THE EMERSON ELECTRIC MFG. CO.
ST. LOUIS, MO. Branches: New York • Detroit • Chicago

EMERSON ELECTRIC

MOTORS — FANS — APPLIANCES

LEADERS IN THE FAN AND MOTOR INDUSTRY SINCE 1890

pipe, we have K equals 222 divided by 12 (170-135), or 0.55 and since the K factor is greater than this, we should merely need to reduce our air temperature by increasing the fan speed.

Suppose we cannot reduce our air temperature; what then? Nothing, but a slightly warmer floor and better comfort. The same total heat is being delivered, so the room temperature is not changed; only the manner in which the heat is entering the room.

This floor panel system has been used to heat rooms ordinarily considered impossible or impractical. For example, a house in Iowa was nearly cubical, rock wool insulated, brick veneer, wall coefficient 0.06 and the unplastered 8 inch brick wall of the garden room, (0.39) was attached to the house only by a door, and had windows on four sides. We insulated the ground with dry sand and ½ inch rigid insulation cemented over. Then the hollow tile and cement top floor made a warm air plenum from which we took galvanized angle ducts to grilles of a size to just replace a brick. The branch duct feeding this has a manual damper and they have never needed a separate thermostat to keep this room perfect in any weather.

The self-leveling comfort characteristic of this floor panel system is one of its most valuable features. As the outdoor temperature goes down to zero and the outside walls inner surfaces become colder, the floor promptly becomes warmer to offset increased bodily radiation, since the heating unit must run longer or more frequently with the simplest kind of thermostatic control.

Insulated Wall "U's"

By William Scott

CONTRACTORS adding insulation to walls and ceilings are often unable to figure the heat losses, even with the proper data.

The following formula is calculated to cover all such cases:

$$\frac{xy}{xn + y} = \text{coefficient of insulated wall.}$$

$$xn + y$$

Wherein

x = coefficient of original wall.

y = conductivity of insulation.

n = thickness of insulation in inches.

If the wall is insulated by the addition of two kinds of material, find the coefficient first with one kind, and then add the other layer according to the formula.

Example

The coefficient of a wall is .3, and two layers of insulating are added with conductivities respectively .34 and .4; one being one-half inch thick and the other two inches thick.

$$\frac{.3 \times .34}{.3 \times \frac{1}{2} + .34} = .21, \text{ coefficient of wall with one layer insulating.}$$

$$\frac{.21 \times .4}{.21 \times 2 + .4} = .1, \text{ coefficient of entire wall.}$$

The coefficient for a wall with any number of added layers can easily be calculated by the same formula.



KRUSE is Equipped With AMERICAN FILTERS

Jealous of its twelve years' record for never having to supply a single repair part of any kind for its oil furnaces, the Kruse Company, Indianapolis, wisely selected American Throatway Filters as being the most satisfactory air cleaner they could obtain.

That American Furnace Filters meet the requirements of exacting engineers as to design, workmanship and performance is evidenced by the fact that they have been selected as standard equipment by many of the country's leading furnace manufacturers.

Write for bulletin 117C which will bring you information on the complete AAF line of Furnace Filters.

AMERICAN AIR FILTER CO., INC.
INCORPORATED
113 Central Ave., Louisville, Kentucky
In Canada: Darling Bros., Ltd., Montreal, P. Q.



See Your Jobber or Write

AUTOMATIC PRODUCTS COMPANY2452 N. 32nd Street
MILWAUKEE WISCONSIN

HUMIDITY CONTROLS

None Give You More
— You Can't Afford
to Accept Less

If you have a problem in humidity control in its application to modern air conditioning, you can't afford to guess or gamble.

④ Humidity Control Sets are designed and built to meet all requirements. Simplicity of design insures dependable and positive operation at all times.

Sensitive to the slightest variation in relative humidity, yet not affected by existing room temperatures. Controls uniformly within a relative humidity differential of 3%.

ELGO SHUTTERS and DAMPERS for ALL INSTALLATIONS



FIG. 1

For Complete and Efficient Ventilating Systems use Elgo Shutters, and Dampers. Fans and Blowers, as well as expensive duct work, can be protected from all inclement weather and as a result last much longer.

The Stationary Shutter "Elcon Type" (Fig. 1) is welded into one ridged unit and is used where the automatic shutter is not permissible. It can be used with equal efficiency on either exhaust or intake of air.

The Automatic Stack Damper "Erie Type" (Fig. 2) is installed inside stacks used for exhaust and prevents down drafts when fan or blower is not operating.

The Automatic Back Draft Damper "Erwin Type" (Fig. 3) is used where it is necessary to maintain air pressure in one direction and prevent back-draft.

The Automatic Shutter "Elgo Type" (Fig. 4) is used for protection of Fans and Blowers.

Write now for all information.



FIG. 2



FIG. 3

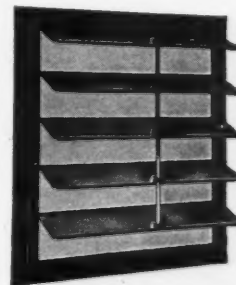


FIG. 4

ELGO SHUTTER & MFG. CO.
DETROIT MICHIGAN

Air Conditioning In Subdivisions

(Continued from page 123)

Warm air registers are in the walls, but the return grill is built into the floor. This arrangement, so it was pointed out, prevents possible interference with plumbing pipes in the walls and with registers in adjoining rooms. Schutzel-Harding homes, five and six rooms, sell for \$6,500 to \$8,500, depending upon location and type of construction. The lower price homes have been built at Raytown, a suburb.

Gas fired, air conditioning, warm air furnaces were installed in some of the homes which the Master Craftsmen, Inc., realtor-builders of Kansas City, built in adjoining suburbs in Missouri and Kansas. In the homes which sold as low as \$4,250 a fan and other accessories may be added to the heating plant later. Dwellings worth \$5,500 to \$7,100 were fully equipped.

St. Louis, Mo.

Warm air, winter air conditioning furnaces are standard equipment in the new homes which Olga S. Van Deusen, Inc., is building in St. Louis and suburbs, as are insulated ceilings. Using either gas or coal as fuel, the heating plant delivers filtered and humidified air to the upper floors through wall registers with cold air returns in the baseboard. The plants cost \$500 each and are installed in homes of true English, Dutch and Colonial design. Ordinarily the dwellings contain five

rooms, but where more space is needed, rooms in the attic are finished off. In such cases, the roof is insulated. These homes range from \$6,500 to \$7,500, depending upon the extras. Lots measure 40 x 133 feet.

Hutchinson, Kan.

At Hutchinson, Kansas, where C. E. King has just opened his third subdivision of 80 acres, frame homes containing five, six and seven rooms are being built to sell for \$3,000 to \$5,000. Financing is almost entirely under the Insured Mortgage System of the Federal Housing Administration. Gas-fired, gravity warm air furnaces are being installed, prices of the units running from \$250 to \$325. The higher prices prevail where buildings are story-and-a-half and two stories.

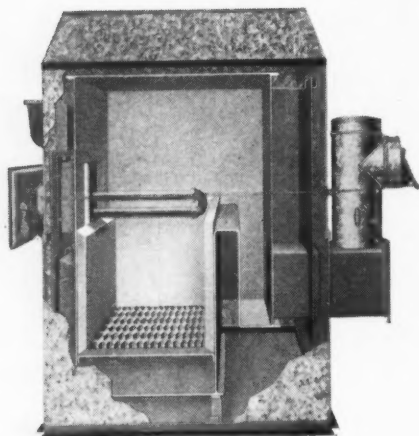
These few examples, from just one section of the country, are, according to reports, fairly typical of the spread of winter air conditioning into the real estate development market. As emphasized in these examples, the amount of air conditioning—that is whether winter, or year 'round, or just high quality gravity or forced air heating—depends principally upon the total selling price of the houses. Seemingly, the average realtor wishes to give as much air conditioning as he can for the salesprice prevailing.

A trend in heating equipment for new homes is apparently being made toward warm air. The kind of warm air heat—gravity or mechanically circulated—depends upon the price of the building. Where the cost runs beyond \$5,500, conditioned and circulated warm air seems to be the tendency.

HESS

FURNACES AND AIR CONDITIONING EQUIPMENT

◆ DISTINCTIVELY DIFFERENT ◆



Cutaway View of Hess Furnace

Hess furnaces are easier to sell because of many features of superiority in value and performance. Why sell ordinary furnaces as sold by mail order houses and competitive dealers? Hess equipment will make easier sales and greater profits for you.

Hess furnaces are not high priced but in line with conventional round steel furnaces of equal sizes.

Our Benefactor furnace is our price leader and in line with ordinary cast iron furnaces of equal sizes. It is also of welded steel, rectangular shaped, with heavy firebrick lining.

Hess and Benefactor furnaces also come in combination with Hess Blower Filter Units and air conditioners. The Hess line is complete and will fill your every requirement.

WRITE TODAY FOR DEALER PORTFOLIO
EXCLUSIVE TERRITORY PROTECTION OFFERED

HESS WARMING & VENTILATING CO.

FOUNDED 1873

1211 S. WESTERN AVE.

CHICAGO, ILL.

APEX DAMPER REGULATORS

...for your next Air Conditioning Job!

APEX Damper Regulators are strongly made of the finest materials. They are all cadmium plated, pressed steel, locktite type with a sliding bearing for easier installation. They are made in two sizes— $\frac{1}{4}$ " for small pipe and $\frac{3}{8}$ " for large pipe.

Send for a sample and prices on the new series Style "C" APEX Damper Regulator. Write now!!

OHIO PRODUCTS COMPANY
17606 MILBURN CLEVELAND, O.

QUALITY



Throughout

in the Scott-Newcomb Air Conditioner illustrated above, as in all S-N Products . . . automatic oil, gas, or stoker fired boilers and furnaces . . . conversion stokers and oil burners . . . oil and gas fired hot water heaters . . . central system and unit air coolers . . . the finest in materials, design, and workmanship, with prices fully competitive.

Write for complete details

SCOTT-

1929 Pine St.



NEWCOMB

St. Louis, Mo.

what will
FURBLO
do in
1937

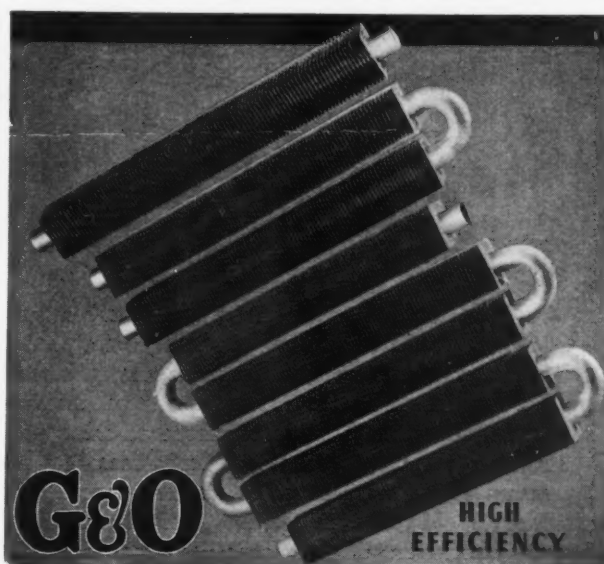
?

from
flames and
ASHES arise a
NEW FACTORY
a **NEW POLICY**
and a **NEW LINE**
!

They will set
the industry
AFLAME!

watch for a
**SENSATIONAL
ANNOUNCEMENT
NEXT MONTH**

FURBLO CHARGES ONWARD!



SQUARE FINNED TUBING

WE are splendidly equipped to supply high efficiency Finned Tubing and Complete Coils for all heat transfer purposes.

Special Shapes, Bends and Continuous Coils

Correspondence invited.

The G&O Manufacturing Co., New Haven, Conn.

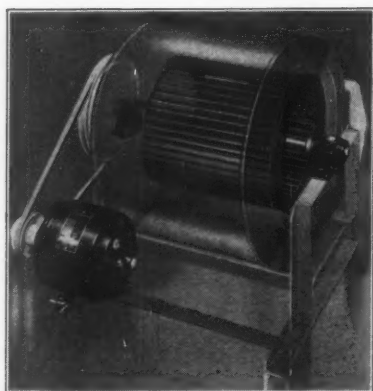
Pioneer Manufacturers of Individual Square Fin Tubing in the United States

What You've Been Waiting For— The BRADEN-EVEREDY Warm Air Conditioning Unit



The BRADEN-EVEREDY—Entirely eliminates fuel dust filters all warm air controls humidity has forced air circulation automatic heat low cost operation can be installed in either new homes or as replacements for old furnaces. WE ASK YOU to investigate this NEW, PROVEN, revolutionary furnace. It will prove a trade-builder and money maker for you. WRITE TODAY to Dept. AA-1 for complete information.

OIL BURNER BUILDERS, Inc.
Bellevue, Iowa



Peerless supplies all the parts except the frame—you build the remainder.

PEERLESS AIR CONDITIONING EQUIPMENT PARTS

Manufacturers of air conditioning equipment who want a dependable source of supply for

**BLOWER WHEELS
PILLOW BLOCKS - BELTS
PULLEYS - MOTORS**

find in Peerless exactly what they seek. Write for complete details and prices.

FAN AND BLOWER DIVISION

Peerless **ELECTRIC CO.**
Warren Ohio

Cost of Summer Cooling

(Continued from page 120)

of the severity of the seasons, this data indicates a fluctuation of 750 per cent between the mildest and severest season, and a variation from the mean of as much as 350 per cent.

Granting the limitations of the applicability of operating costs determined in only one given community and in one residence, Tables 1 and 2 are included as a matter of general information, to be used with discretion by experienced air conditioning engineers capable of appreciating the limitations involved. No account of the initial costs of the plants has been taken into consideration.

General Data

Table 1 gives seasonal weather data and hourly operating data for the three types of central cooling plants operated in the Research Residence during the summers of 1932, 1934, and 1935, using ice, mechanical refrigeration and water from the city water mains for cooling and dehumidifying the air. The operating costs are based on the actual measured ice, water, and power consumptions of the various units included in the systems, and when the plants were operating at normal capacity under approximately equilibrium conditions. The local water and power rates of 33 cents per thousand gallons, and 3.1 cents per kw. hr. were used in the calculations, and the price of ice was assumed to be \$4.00 per ton.

In comparing the total operating cost per hour with the different cooling plants, cognizance must be taken of the variation in the capacities of the plants and the indoor conditions maintained in the residence. Probably the most legitimate comparison can be made from the values given in the column "total cost of operation per ton of refrigeration delivered in cents per hour." These values are based on the total amount of heat, including the sensible and the latent heat, removed from the air as it passed through the cooling coils. With the plants as installed and operated these values were 18.56 cents for the plant using ice, 5.49 cents for the mechanical refrigeration plant, and 6.61 cents for the plant using water from the city water mains.

How Costs Were Calculated

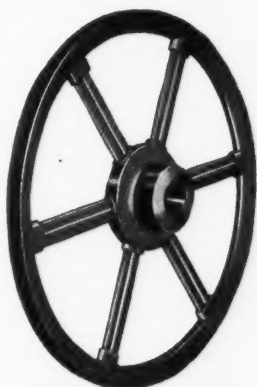
Table 2 is included to give some approximate practical information as to what would have been the seasonal cost for cooling the residence under the conditions, and during the seasons indicated. Due to the variations in the severity of the seasons, in the operating conditions, and in the indoor conditions maintained, comparisons should not be made between the seasonal operating costs for different summers.

Actually, with exception of the summer of 1935, the residence was not cooled by any one method during an entire season. In 1932 one series of tests was conducted with the windows of the residence equipped with awnings and another series was conducted without awnings. The total seasonal operating costs in dollars for the summer of 1932 were calculated, first, on the assumption that the awnings were in place the entire season, and, second, on the assumption that no awnings were in place at any time. These calculations were

PULLEYS

Designed for Air Conditioning

- ★ True Running
- ★ Rugged Construction
- ★ Smooth Finished Grooves
- ★ Smooth, Quiet Operation

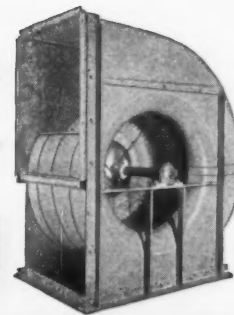


Diamond bored Balanced Stock of 500,000 Fits the Belt Gray finish 1½" O.D. to 14" O.D. Also, four sizes of VARIABLE SPEED PULLEYS. Sample pulleys available for tests—bore size and diameter necessary.

CONGRESS TOOL & DIE COMPANY

9034 Lumpkin Avenue
DETROIT, MICHIGAN, U. S. A.

If You are Looking for Quality

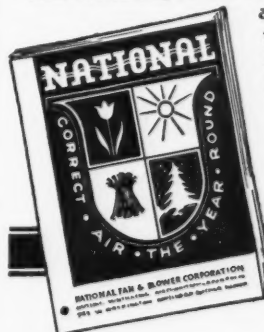


HERE IT IS!

Absolutely dependable quality that will completely satisfy your most exacting customers.

NATIONAL AIR CONDITIONING EQUIPMENT

Satisfactory service is the outstanding feature of the National Line of heaters, ventilators, blowers, propeller fans, exhausters, air washers, furnace air conditioning units, etc. Everything sold under the National label is right in construction, right in performance and right in the amount of profit for dealers. One nameplate — one guarantee.

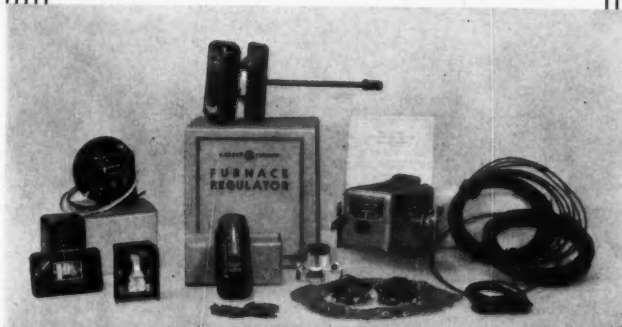


NATIONAL FAN AND BLOWER CORP.
541 W. Washington Boulevard, Chicago, Ill.

SEND FOR THIS CATALOG

A 100% Dealer-Jobber Policy
WRITE FOR DEALER FRANCHISE

Barber-Colman BLOWER CONTROLS



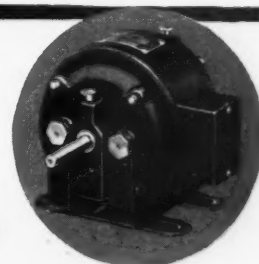
for SOLID-FUEL FURNACES

Set No. 1031
(Shown above)
Complete, List
Price \$51.50

- Accurate, reliable, fully automatic, low-voltage control systems for hand-fired, solid fuel, forced warm air heating plants. Six new sets now available, three of them containing Barber-Colman's exclusive COMPENSATED CONTROL. Complete accessories and installation instructions furnished. Good profits for dealers. Thousands of homes need these controls now. Write for further information.

BARBER-COLMAN COMPANY
ROCKFORD • ILLINOIS

Where Only the Best Motors Will Do



The air conditioning unit which must operate with the utmost quietness and reliability—there is the place for an Ohio Motor,—for it is as scientifically designed and as carefully built as the finest air conditioning unit of which it is a part. You can depend on Ohio Motors for long, trouble-free service.



THE
**OHIO ELECTRIC
MANUFACTURING CO.**

5910 Maurice Avenue
Cleveland, Ohio

OHIO MOTORS



Nu-Way
Genli

CONVERSION BURNER

When you convert a heating plant into an automatic oil burning furnace—BE SURE the burner is a quality product—efficient, service free, and dependable—because your reputation depends upon its performance. Nu-Way "Genli" automatic oil burners are quality products.

The Nu-Way "Genli" is America's most complete line of fully automatic heat.

The Famous Nu-Way "Genli" Oil Burners.
The Nu-Way Evans Warm Air Conditioner.
The Nu-Way "Genli" Hot Water Generator.
The National Nu-Way Oil Heating Units.

Write today about a dealer franchise with this outstanding heating line.

THE NU-WAY CORP.
Rock Island Illinois

SUPREME HUMIDIFIERS

Spray Type—Electrically Controlled
For Warm Air Furnaces

Increase Comfort and Fuel Economy by
Effective and Controlled Humidity

...

Air Conditioning Controls—Electric Valves
Spray Nozzles

Send for Circulars

SUPREME ELECTRIC PRODUCTS CORP.
103 Mt. Hope Ave. Rochester, N. Y.

ECONOCOL

Join the nation's fastest growing industry by lining up with ECONOCOL. It's the leader in performance, low upkeep, appearance, and value. Write today for details on profitable, exclusive dealer franchise.



**ECONOCOL STOKER DIVISION OF
COTTA TRANSMISSION CORP., Rockford, Ill.**

STOKERS

made possible by determining performance curves for each method of operation which gave the relationship between the degree-hours above 85 deg. F. per day and the compressor operation or plant operation in hours. From curves of this type for each method of operation, and from weather data giving the number of days and degree-hours per day above 85 deg. F., it was possible to estimate the total number of hours that the plant would have had to operate for the entire season. Then, applying the hourly operating costs as given in Table 1, the total seasonal cost was determined.

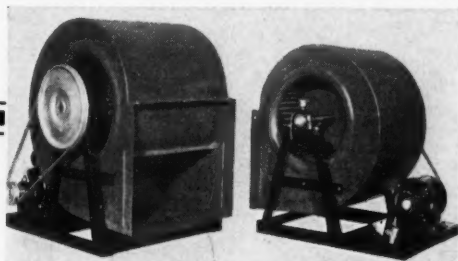
Cost With Awnings

By this method of calculation it was estimated that if the east, south and west windows of the residence had been equipped with awnings during the entire season, the seasonal operating costs using ice at \$4.00 a ton would have been about \$174.56, while if no awnings were used the cost would have been \$258.67. This indicates that awnings would have effected a saving of approximately \$82.00, or 32.5 per cent, in the total seasonal operating costs during the summer of 1932 when ice was used as the cooling medium.

During the summer of 1934, when the mechanical refrigerating plant was used, one series of tests was conducted taking advantage of cooling by circulating outdoor air through the house at night whenever it was feasible to do so, and another series was conducted keeping the house closed and using only mechanical refrigeration. Awnings were fitted to all east, south and west windows the entire summer. Performance curves for the two methods of operation were determined, and from these curves, weather data for the summer of 1934, and the hourly operating costs as given in Table 1, the total estimated seasonal operating costs for cooling the residence during the summer of 1934 with the mechanical refrigerating plant, supplemented with the circulation of outdoor air at night, was \$62.65. If no outdoor air at night was used to supplement the cooling with the mechanical refrigeration plant, the estimated seasonal operating cost would have been \$75.09. This indicates that by supplementary cooling with the circulation of outdoor air at night a possible net saving of \$12.44, or 16.6 per cent, might have been effected over cooling with mechanical refrigeration alone.

Cooling With City Water

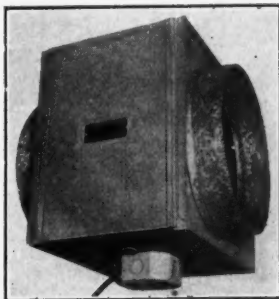
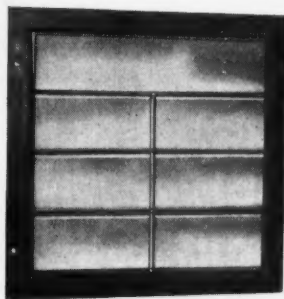
In 1935 only one method of operating the central cooling plant when using water from the city water mains was employed. The windows were equipped with awnings and the mild summer made it possible to supplement the artificial cooling each day with the circulation of outdoor air at night. For this particular season and with the method of operation employed, the total seasonal operating costs were \$36.91. It should be remembered, as shown in Table 1, that, while the indoor conditions maintained were a substantial improvement over what they would have been without any cooling, they were not as satisfactory as those maintained with the plants used during the summers of 1932 and 1934. The cost items in Tables 1 and 2, other than those specifically mentioned, show the operating costs of the different units included in the cooling system.

ARTCRAFT
HEAVY DUTY DOMESTIC BLOWERS**DEALERS: "BUY THE BEST"****CHICAGO STEEL FURNACE CO.,** write
7934 So. Chicago Ave. BLOWER DIVISION
Chicago, Illinois**LET ME HELP YOU**
for fifteen days

● I am the Practical Recording Thermometer—portable, dependable and easy to use. Hundreds of heating dealers use me in selling and service work. I give them 24 hour temperature records on a 4 inch, easy-to-read chart. Pen and bi-metal element built in door, swinging out of way when chart is changed. Let me work for you for 15 days on a trial basis. Write for information about this 15 Day Trial offer.

Practical Instrument Company,
2713 N. Ashland, Chicago.

ASK YOUR JOBBER

PRACTICAL *Recording Thermometer***FORCT-AIR****ONE PIPE WARM AIR
HEAT BOOSTERS****IN-A-PIPE FURNACE FANS
HEAVY DUTY EXHAUST FANS
ATTIC FANS CIRCULATORS****ATTENTION**
JOBBERS—DEALERS**FORCT-AIR CO. ROCKFORD
ILLINOIS****• SILENT •
AUTOMATIC
SHUTTERS**

Operate by gravity on any type of fan. In use today by over 75% of the manufacturers of heating, ventilating and air conditioning equipment. *There is a reason.* Write at once for

literature fully describing same and prices.

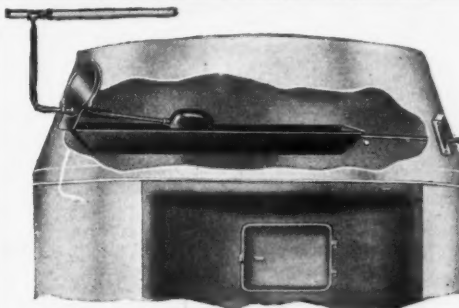
AIRECON INDUSTRIES, INC.

2648-2654 Botsford Ave.

Detroit, Mich.

AUTOCRAT *Balanced Flame* **OIL BURNERS****The Oil Burner That
STAYS SOLD!****Endorsed by leaders
in warm air heating****AUTOCRAT OIL BURNER CORP.**

CEDAR RAPIDS, IOWA, U. S. A.

*Also:*

Draft Boosters.
Register and
Duct Boosters.
Pan Fillers.
Controls.
Kitchen Fans.
Exhaust Fans.
Shutters.

A GUARANTEED HUMIDIFIER at \$7.20 (Dealers). Complete, ready to install. COPPER pan gives maximum evaporation. Non-rusting materials and valve located OUTSIDE of bonnet, insure long, trouble-free service. Sell every customer one!

Write for Catalog No. 30-D.

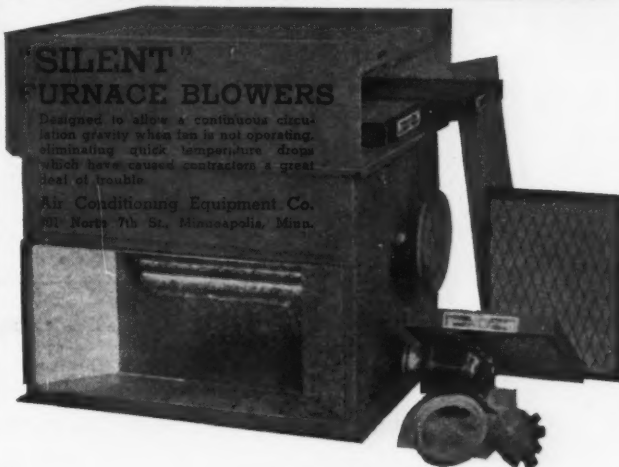
UNIVERSAL BLOWER COMPANY, Birmingham, Mich.**"ALNOR" VELOMETER**

(BOYLE SYSTEM)

**Instantaneous-Direct Reading
Air Velocity Meter
20 FPM to 6000 FPM***Write for Folder***ILLINOIS TESTING LABORATORIES, INC.**
412 No. La Salle St. Chicago, Illinois**"SILENT"
FURNACE BLOWERS**

Designed to allow a continuous circulation gravity when fan is not operating, eliminating quick temperature drops which have caused contractors a great deal of trouble.

Air Conditioning Equipment Co.
601 North 7th St., Minneapolis, Minn.



*** AIR CONDITIONING *** TRENDS

Issued From
"AIR CONDITIONING
HEADQUARTERS"

JANUARY
1937

Keeney Publishing Co., Publishers of "Heating, Piping & Air Conditioning" and "American Artisan" • 6 No. Michigan Ave., Chicago

HOW IMPORTANT ARE THE UTILITIES TO YOUR SALES PROGRAM IN 1937

Power Company Executive Says
Better Understanding is Vital to
Growth of Air Conditioning

Stressing the "mutual interest" of the manufacturer of air conditioning equipment and the public utility industry which sees in air conditioning its most important load potential since the introduction of electric lighting, Robert S. Hitchcock, vice-president of sales for the General Light & Power Company, challenges both industries to work together for mutual profit in 1937.

In a thought provoking interview, Mr. Hitchcock said that neither the manufacturer nor the utility "have begun to realize what can be accomplished through their cooperation."



Air Conditioning TRENDS Makes its Bow

Air conditioning has emerged out of infancy and adolescence to the stature of a full grown industry within the span of a young man's business life time.

It is destined to enter upon a stage of commercial expansion second to few industries of our time.

The brilliant engineers who conceived and founded it are passing on the torch of leadership to an equally gifted group of sales-minded merchandisers and executives gifted with the "money sense" in management.

"Trends" is dedicated to those whose interest leans more heavily to the Sales Side of Air Conditioning. Each month it will give to present, concise and in news fashion, important subjects of current interest and thought to the salesmen of the industry.

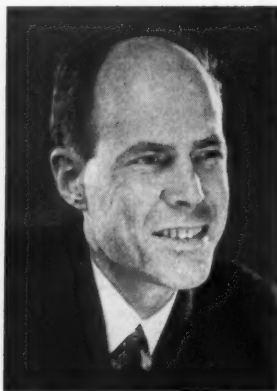
A MONTHLY NEWS BULLETIN to interpret the SALES SIDE of the AIR CONDITIONING Industry

● We believe sales, advertising and administrative executives in Air Conditioning can use to good business advantage a regular medium of information to reflect and interpret important sales trends in this fast-growing industry.

The engineering problems of the industry are being competently and adequately handled from a publication viewpoint. Similarly authoritative treatment of its sales and merchandising aspects is needed.

Where can the sales and advertising manager, the board chairman or the president put his finger on facts and trends that will assist him in charting a course through the troublesome and exciting days ahead?

"Air Conditioning Trends," an informal monthly news bulletin to be issued by Keeney Publishing Company starting in January, has been designed to fill this need. Each issue of "Trends" will be devoted to one or more important and basically fundamental subjects that are of current



BREWSTER S. BEACH

interest to those responsible for the business development of Air Conditioning. Every month it will attempt to feel the commercial pulse of Air Conditioning and to report it for the benefit of executives who must keep abreast of the most progressive thought.

The editor of "Trends" will be Brewster S. Beach, public relations consultant of New York, formerly advertising manager and director of publicity of Carrier Corporation, who for many years has been prominently identified with industrial promotion.

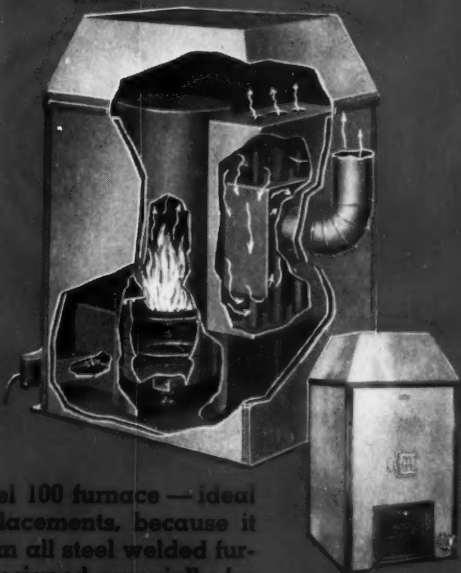
"Trends" is not a commercial venture. It is a contribution and a service to better selling and promotion of Air Conditioning. It will be distributed each month with the compliments of "Heating, Piping and Air Conditioning" and "American Artisan" to selected sales, advertising and administrative executives within the industry.

"HEATING, PIPING and AIR CONDITIONING"
"AMERICAN ARTISAN"

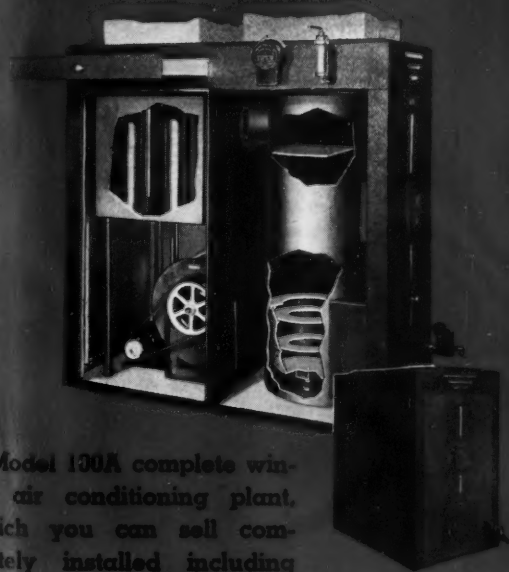
PUBLISHED BY KEENEY PUBLISHING CO., 6 NO. MICHIGAN AVE., CHICAGO

Lochinvar for.

DEPENDABILITY
BEAUTY • ECONOMY
DURABILITY *at low cost...*



Model 100 furnace — ideal for replacements, because it offers an all steel welded furnace designed especially for oil and our burner—gives fully automatic oil heat at a price no more than a 24" coal fired furnace—its equivalent in heating capacity, and much less than an oil burner alone—ideal too for new home construction—can easily be converted to winter air conditioning.



Model 130A complete winter air conditioning plant, which you can sell completely installed including duct work and registers, for from \$200 to \$400 less than your nearest competitor. Meets every demand and requisite of architects, builders and home owners for automatic oil heat and air conditioning plant.

Lochinvar products enable you to sell high quality oil burning equipment at the lowest cost.

Many more homes are prospects for oil burning furnaces and water heaters when you can offer them at Lochinvar prices. High original cost is no longer a factor.

The revolutionary exclusive Lochinvar Multiple-Stage burner makes this possible. It burns No. 1 fuel oil with highest efficiency—"whisper silence"—and is clean at every capacity. It has no moving parts—no blowers—no pumps—no electric ignition—nothing to need servicing. Its simplicity makes an inexpensive burner to make, and we pass the savings on to you.

All Lochinvar products have full automatic control. No. 100 furnace—costs your customer about the same as a coal fired furnace and much less than a oil burner alone—an excellent unit for replacement. No. 100A furnace is complete winter air conditioning plant, with warm air circulation, air filter, controlled heat and controlled humidification. The Lochinvar water heater provides 1600 gallons of hot water per \$1 fuel cost (oil at 8c per gallon).

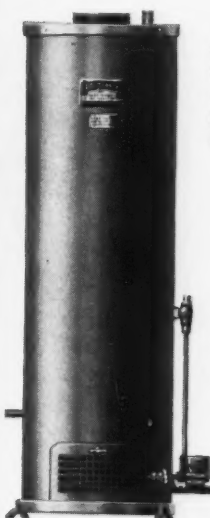
All Lochinvar products are strongly built—correctly designed—and have beautiful, durable finish.

Profit is highest—write for full details.

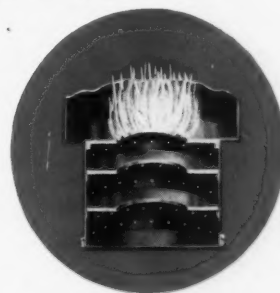
LOCHINVAR CORPORATION

11921 Grand River Avenue

Detroit, Michigan



The Lochinvar "40" water heater is fully automatic, being thermostatically controlled—gives an abundance of hot water at the lowest possible cost, yet it costs no more than a gas or electric heater.



A cross section of our exclusive Multiple-Stage burner. There are no moving parts, yet its efficiency and cleanliness are unequalled by the most expensive mechanical burner made.



Send
all
details.

Name

Address

Firm

City

State

Lochinvar OIL BURNING PRODUCTS



AN
Appreciation
AND A PLEDGE

*A tribute to those who made possible the success of the
Lamneck System of Prefabricated
Duct and Fittings*



AS 1936 FADES INTO 1937 we cannot help but pause a moment in the hurried clamor of the day to reflect upon the progress of the past 12 months.

For progress has been made—real progress, by the Warm Air Heating Industry, toward the goal of better and more healthful living conditions in homes and in public places.

We at Lamneck's are happy to have had a constructive part in the march toward that goal. Our share has been to lead the way to a better, more economical, and more efficient system of prefabricated duct and fittings, and to provide a series of "helps"—the Lamneck Guide Chart, the Lamneck Takeoff Pad, and the Lamneck Manual—which has made the work of everyone who has to do with the ordering, pricing, and installation of forced air systems, easier, quicker and more accurate.

That we have succeeded in designing both a system of prefabricated duct and fittings, and a series of "helps" that are really helpful, is amply proved by the enthusiastic acceptance of both the systems and the "helps."

But we would be remiss if we did not take this opportunity to place credit where credit is due for our real success of the past year. That credit belongs squarely on the shoulders of the many Lamneck jobbers and Lamneck dealers and the engineering departments of the larger manu-

facturers throughout the country who have cooperated with us so ably and enthusiastically and who have done such a splendid job in securing a widespread acceptance for the Lamneck plan.

We salute our jobbers and dealers and the manufacturers of warm air and air conditioning equipment! We commend them for the excellent work they have done. Without their loyal support we could not have achieved the unusual success which marks our records for the past year.

As a mark of our appreciation, we pledge to these jobbers, dealers and manufacturers that we will strive still more earnestly to provide them with a system of prefabricated duct and fittings and a method of installation which will make possible even greater savings in installation time and money than before, and will make it possible for them and their customers to make a larger number of installations in a shorter time and thereby increase both volume of work and profits.

We are looking forward to the greatest year in the history of our industry. We know that it will be our greatest year if we continue to enjoy the loyalty and cooperation of the Lamneck jobbers and dealers and the manufacturers of warm air and air conditioning equipment throughout America who contributed so greatly to our success in 1936.

PERL S. MILLER, *President*
Lamneck Products, Inc.

LAMNECK PRODUCTS, INC.



414 DUBLIN AVE. • COLUMBUS, O.

1937 N W A H & A C Assn. Meeting

THE December meeting of the National Warm Air Heating and Air Conditioning Association was, in the opinion of most of the officers and directors present, one of the liveliest and best attended conventions ever held by the association. There were more than 450 registrations and undoubtedly many dozens of persons who did not register. The sessions were well arranged to cover a wide variety of subjects, all subjects being assigned to authoritative speakers. Most of the sessions were very well attended.

Through the President's Spectacles

President Rybolt opened the convention with an address "Through the President Spectacles." Asserting that the Association has always paid large dividends to its members, President Rybolt said—"In my opinion there was never a time in the history of the industry when organization is as necessary and important as it is today. We need a better, more powerful, a bigger organization. Better financially, bigger numerically, and more powerful in influence. We have accomplished wonders in research particularly the research carried on in the Research Residence under the direction of the University of Illinois Engineering Experiment Station and the Research Advisory Committee. Research has been handicapped during the past few years by lack of finances, but the Board of Directors recently established a schedule, based on sales, to determine the amount of dues each member should pay. I heartily recommend your approval of this schedule.

"Today we may definitely anticipate legislation that will add taxes of many different kinds to the burdens of our industry. We may anticipate legislation to regulate, to inspect, and to supervise our industry. Legislation on hours, wages, and working conditions and more on prices, competition and so forth. Our industry collectively or individually has never, within my recollection, protested any of this new legislation. This wave of new legislation affecting the profits of our industry is capped, in my estimation, by the surplus profits tax. Business men too seldom call on legislators, but business men should be able to speak collectively and emphatically through their respective associations. This we should do.

"In addition to these problems we must face next year additional complications arising from the Social Security Act. Many of us have had to face this year the problem of a shortage of labor and next year it is probable that the entire industry—manufacturers, distributors, contractors—will all find themselves up against the problem of finding labor to complete the contracts on hand. This, of course, providing that business maintains its present level of activity or increases.

"I have always maintained that one of the chief

duties of this organization is to properly advertise the work of the association and properly advertise the merits of warm air heating and warm air, air conditioning. Competitors in air conditioning are becoming increasingly active. To be sure we cannot see as yet that these competitive industries are running away with our business, but we must recognize that all propaganda which the radiation industry is feeding to the public, is making that public conscious of radiation, air conditioning. We still may be getting the great majority of residential air conditioning business, but the activity of the radiation industry is making it necessary for us to break down the sales resistance that their propaganda is creating. This means greater sales expense for us. It takes time to sell an idea to the public and it takes just as much time to unsell the public on any idea. We may be far ahead of competition in technical knowledge, but no one of us can foresee the developments of the future and if we continue in our 'Silence is Golden' attitude of buying it is not improbable that some day we may wake up to discover that our technical advantage has been wiped out and our aggressive competitors have jumped a long stride ahead of us."

What an Opportunity!

Bennett Chapple, of American Rolling Mill Company, speaking on the subject "What An Opportunity," declared that the sky seems to be the limit in appearance and comfort offered by air conditioning and that even nature has seemed to conspire to flow dollars into our business both Summer and Winter. Declaring that the Association has accomplished a wonderful result through the setting up of standards of engineering design and installation, Mr. Chapple said, "The public has turned to warm air heating and air conditioning in greater appreciation than ever before and you as an industry are fortunate in having these years of experience and research to guide you in meeting the new demands that are coming upon you. The heating and ventilating industry is not alone in this movement. Allied forces are gathering for this great expansion of the heating and ventilating business. Take, for example, the part iron and steel plays in the picture. The whole civilized world, it seems, has turned to products made of sheet metal. Not only is the air conditioning industry leaping forward, but everything else—household appliances, automobiles, streamline trains are using sheet metal in ever increasing quantities. Where would we be today if there were none but the old fashioned hand mills to serve this greatly increased demand for sheet metal? The point I want to make is that the invention and perfection of the continuous rolling mill is one of the bright spots in the development of the heating and ventilating business, as it is to the whole sheet metal world. The twenty-one contin-

nous mills now in operation are producing sheets at the rate of one ton every thirty seconds.

"New business, new houses, old houses remodeled—all kinds of business awaits you. We are millions of houses behind in this country and more millions of actual remodeling jobs behind. Authorities agree that if we build as many houses each year for the next ten years as we built during our peak years (when we built 400,000 a year) we will still be far behind the normal demand. You know more than I about the number of manufacturers that have entered the air conditioning industry. You know only too well that there has been a great influx of dealers and jobbers. Business is booming. It will be most unfortunate if history repeats itself in connection with air conditioning but from what I learn, there is grave danger of this very thing occurring. You as an industry have always been thoroughly sold on the idea that warm air heating was the very best type; providing healthful heating, humidification, circulation, and the like, but the public never caught the fever. Strangely enough the spark that did set off the great wave of public sentiment was cooling rather than heating. While it may be true that present equipment for complete, year round air conditioning is beyond the reach of many home owners, there is a great opportunity to capitalize the popular sentiment for air conditioning which the public regards largely as cooling.

Sell Results—Not Means of Getting Them

"There is, too, a tremendous opportunity in the replacement of furnaces. A recent survey made by one of the members of your association shows more than eight and one half million furnaces in use and a replacement market of at least two million of these furnaces. This volume of business seems incomprehensible, but it does exist. Is it possible that the merchandising methods of the industry need overhauling? I have already referred to the advent of manufacturers to this industry who have long been recognized for their progressive merchandising methods in other industries. These organizations have never sold their products by the pound. Their merchandising methods have been based on selling comfort, convenience and service rather than commodities. They have made outstanding successes by following these merchandising policies and it seems reasonable to conclude they will follow these same policies in merchandising their heating and air conditioning equipment. This bespeaks a necessary change for those manufacturers who have been basing their merchandising on a per pound or per unit price. Generally speaking, the housewife is little concerned with mechanical considerations, but sees only results. She sees your equipment in terms of new comfort, better health, the even flow of conditioned atmosphere, great savings in cleaning bills, clean draperies and decorations, less dusting, less housekeeping and no trouble with dried out woodwork and furniture. She sees the warmth of the tropics in winter and the coolness of the mountains in summer, made possible in her home at the turn of a switch. To

you gentlemen, heating and air conditioning means heating units, ducts, blowers, sheet metal, insulation, but to your customer they spell improved health, longer life, greater comfort and cleanliness such as has never been known before.

"I am convinced that this industry must view the job to be done from the housewife's angle—tell her the results she wants, not the means of getting them. This is the great opportunity and challenge of 1937 and the years to come."

What Shall It Profit Us?

"What shall it profit us" was the subject of the address by Dana W. Norris of Syracuse, N. Y. Mr. Norris said in part—"In the last few years we have all seen a lot of air conditioning work done—good, bad, and indifferent. Most of the mystery has been taken out of air conditioning and we now know what it is all about. Making air conditioning pay, however, is a different proposition. It is generally agreed that our industry stands on the threshold of a tremendous growth. Mere replacement of the two million furnaces which need replacing if made in one year would mean the sale and installation of four times as many gravity furnaces as were ever sold before in any one year. This is entirely beyond the productive capacity of existing plants.

"I do not have to tell you that during the past year nearly every dealer in the country has had more work than he could adequately take care of. But what kind of business were you turning down? Was it profitable or unprofitable business? Many furnace dealers are sheet metal contractors making their own fittings and furnace casings and doing roofing, gutter and furnace work. Many dealers are doing duct work under contract for firms who are direct competitors of theirs in the heating business. We find dealers busy with this kind of work and when asked why they take it, they reply that the business comes to them without solicitation and they are sure of their money. Having gotten tied up with this sort of work, they have no time to go out and solicit business for themselves, that in most cases would be more profitable.

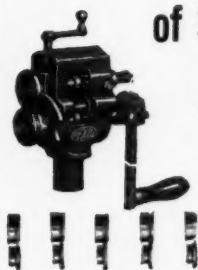
Solicit Profitable Business

"Just a few months ago I visited a dealer and found him taking phone calls, almost one after another, from people who wanted their gutters fixed or roofs repaired. Upon cross examination, I discovered that he was getting a five dollar job here, a two dollar job there and maybe a twenty dollar job once in a while, with the result that he was busier than the proverbial cat sending his mechanics from one job to another while he was piling up some accounts receivable on his books that might be paid in thirty days or thirty months. My Gosh, how he was busy, but it had not occurred to that dealer that he was doing an awful lot of business without making any money.

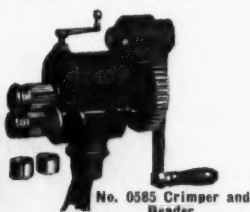
"It had not occurred to him that if he would just put on his hat and coat, tell his office girl to answer the telephone, walk out and call on any

FIRST CHOICE

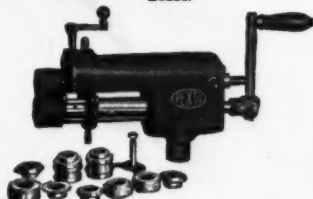
of SHEET METAL WORKERS
for 118 years



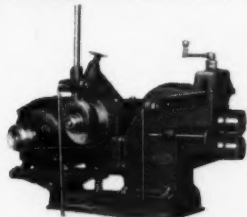
No. 1544 Combination Machine
Turning, Burring, Wiring



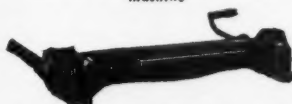
No. 0585 Crimper and Beader



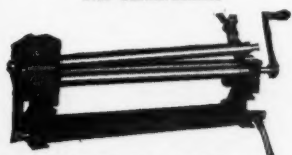
No. 622 Deep Throat Combination Machine



No. 623 Universal Electric Rotary Machine



No. 63 Adjustable Bar Folder with Counterbalance



No. 381 Slip Roll Forming Machine



No. 520 Grooving Machine



No. 137 Foot Squaring Shears

PEXTO

MACHINES
and TOOLS
for
SHEET METAL
WORKING

SHEARS. Foot and Power Squaring Shears. Slitting, Cut-off, Scroll, Circle Shears. Ring and Circle Shears. Flangers, Irregular Cutters.

PRESSES. Inclinable, Horn Punching, Riveting, Double-Crank Straight-Side and Arch Presses. Punching and Notching Machines. Foot Presses.

Folding Machines and Brakes. Forming Machines and Tube Formers. Grooving Machines.

Manual and Electric Motor Driven Turning, Wiring, Burring, Setting Down, Elbow Edging, Beading, Crimping and Seam Closing Machines.

Stakes, Bench Plates, Hand Tools.

Production Equipment for Steel Drum and Barrel Making.

A complete line of equipment for the fabrication of Sheet Metal products. Write us in your requirements.

THE
PECK, STOW
& WILCOX
COMPANY
Established 1819
SOUTHINGTON,
CONN.

DRILL FASTER

and lower your
maintenance costs
with
SKILSAW DRILLS



WE invite a side-by-side comparison with the drills you now use. You will find that SKILSAW DRILLS are better in every detail . . . that they drill more holes per hour, save more in operation, cost less to maintain! SKILSAW DRILLS are engineered to produce these results . . . to stand the gaff . . . yet they cost no more! The next time you buy, insist on SKILSAW DRILLS and you'll never want any other kind! 14 POWERFUL MODELS.

HERE'S WHY SKILSAW DRILLS ARE BETTER:

1. SWITCH—Has longer life because of 100% overload capacity and because all the mechanism is fully enclosed
2. MOTOR—Its greater overload tolerance minimizes heat and lengthens life. Delivers more power under load. in bakelite housing.
3. GEARS—Helical cut gears of tougher, stronger steel last longer and run quieter.
4. BEARINGS—Highest quality ground and lapped ball bearings are grease sealed. They are mounted in all positions to compensate for radial and thrust loads,—to minimize friction and eliminate vibration!
5. FRAME—Die cast aluminum frame is more compact, lighter in weight and 50% stronger.

See Your Distributor and Write for Our New Catalog

SKILSAW, INC.

3302 ELSTON AVENUE, CHICAGO

210 E. 40th St., New York—52 Brookline Ave., Boston
312 Omar Avenue, Los Angeles—2065 Webster Street, Oakland

BRILLION

WARM AIR FURNACES



1937.....
AND AGAIN IT'S
BRILLION!

It's been *Brillion* for the past years with smart, aggressive furnace men. They know real value when they see it, and they also know that the *Brillion* will sell for them and *stay* sold.

Brillion furnaces are made up in various sizes and types to take care of your warm air heating requirements.

Join the "who's who" among heating men... tie up with *Brillion*! Write today for specifications and free literature on the up-to-the-minute *Brillion* line.

BRILLION FURNACE CO.
BRILLION • WISCONSIN

Protects firepots *without tearing down furnace*

WITH an hour's work and a drum of Fireline you can make any fire pot "burn-out" proof—can make even cracked and broken firepots gas-tite. Fireline "fits" all firepots—gives any furnace a modern, efficient refractory lining—increases heating capacity, increases combustion temperature, eliminates smoke and soot, reduces ashes to unburnable ashes—save up to 20% fuel.

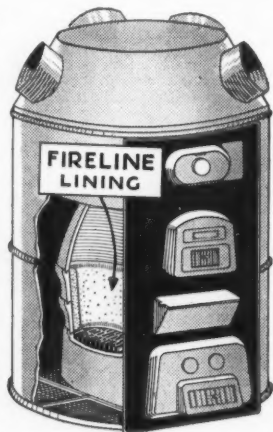
Fireline has created an unlimited market for your services, has created a new year-around business for you.

Fireline every furnace, old or new. It is profitable work (average \$10 per hour for labor, an extra profit in every job).

FIRELINE STOVE & FURNACE LINING CO.
1866-A Kingsbury Street Chicago, U. S. A.

FIRELINE

Fireline is *not* a furnace cement, is *not* a patching material—Fireline is a new thing—a plastic refractory material that comes ready-mixed in air-tite drums. Molded to the walls of a fire pot (any thickness) it sets with an ordinary fire into a 1-piece firebrick lining.



one of the twenty-five people in town whose furnaces were shot, he could make more money in two hours' time than he was making in two weeks of the kind of business he was then doing. On a good gravity furnace job, this dealer should make a gross profit of around \$75. I don't believe he could make that much gross profit in a week's work of the kind he was then doing.

"I have no quarrel with roofers and tanners. My point is simply that if you know how to do furnace work I think you can make more money out of furnace work than out of repairing roofs and gutters, and therefore you might better pass up that work and let it go to the sheet metal man who does not know how to sell or install heating equipment as you do. Remember also that profitable work does not walk into your office like the unprofitable work. You have to go out looking for it. I recommend to every dealer a little time spent in concentrated thinking and planning. Make an estimate of the new heating plants that can be sold in 1937. Estimate the percentage of this total available work that you should get yourself. Break this down into various price classifications so as to arrive at the total volume of sales represented. Break this down further by months so as to show just how much business should be sold each month of the year. Use a mark-up of between fifty and sixty-five per cent of the cost of labor and material and then add to this so much for overhead, selling cost, and a net profit of ten per cent on sales.

Increasing Demand and Rising Profits

"We are in a period of rapidly increasing consumer demand and rising profits. Call it inflation if you will, but profits will not be increased accordingly unless we plan our operations carefully. There will be another depression some day in the future and if we are to be prepared to ride through such a depression without undue hardship, we must make hay while the sun shines.

"Probably you are now faced with a shortage of mechanics. Every successful dealer is going to have to train future mechanics during the next few years. Not long ago I called on a dealer so busy that he was almost crazy, yet at the same time he had three high-class sheet metal mechanics making fittings and duct work for the job he was selling as well as casings and hoods for his furnaces. I said to him 'Why don't you take these mechanics you have in your shop and put them on furnace installations. You can buy furnace fittings of the type you are making.' He said, 'Why should I buy them when I can make them in my own shop cheaper?' I said 'That is true, but granted that you can save one and one-half cents on a wall stack by making it in your own shop, how much more gross profit can you make by selling several more furnace jobs if you could make those shop mechanics of yours available to install them?'

"I have always contended that a dealer is his own best salesman, and I think the smartest thing any dealer can do is to so organize and conduct his business that his own time is available to a very

**AND
NOW**

**A NEW ADDRESS IN DETROIT
2699 GRATIOT AVE**

Where you can secure every type of Furnace or Stove Repair Part, Furnaces, Pipe, Fittings, as well as all types of Air Conditioning Equipment.

Use this complete source of supply for all your needs. Service is the byword. . . Quality is the only standard . . . and Price is the watch word.

PENINSULAR STOVE CO.
DETROIT MICHIGAN



**This is No. 253
CHICAGO STEEL PRESS**

Will Do 40% to 60% of the
Forming Work Turned Out by
the Average Shop

This compact, ruggedly built, 48", No. 14 gauge capacity, Chicago Steel Press brake is an economical and profitable production unit. It is ideally adapted for rapidly forming metal sections such as in stoves, refrigerators, soda fountains, steel cabinets, metal furniture, steel boxes and a great variety of sheet metal specialties. Variable speed drive operates from 17 to 50 strokes per minute. Precision built of highest quality materials by master craftsmen.

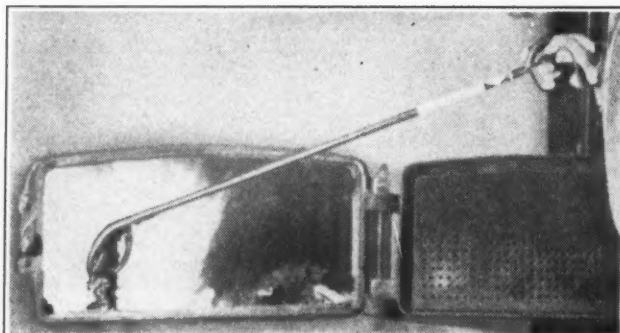
CHICAGO STEEL BRAKE

MADE IN 35 STANDARD SIZES FOR STRAIGHT BENDING AND BOX AND PAN WORK. SPECIAL BRAKES BUILT FOR DIFFICULT JOBS. BEST BY TEST OF OVER 35 YEARS.

LET THESE EFFICIENT TOOLS
GET YOU BIGGER JOBS AND
LARGER PROFITS IN 1937.
DON'T DELAY. . . WRITE NOW
FOR FREE LITERATURE.



DREIS & KRUMP MFG. CO.
7404 LOOMIS BLVD. - CHICAGO, ILL.



NORCO

"HANDY-ANDY" CLINKER TONGS

THE new Handy-Andy clinker tongs are designed to remove quickly and easily the largest clinkers in the firebox. Operation is extremely simple, weight is less than two pounds, and the handle is long enough to prevent burning of the hands.

Here is an excellent sideline for stoker manufacturers and dealers. It will return handsome profits when tied up with stoker sales.

Write today for literature.



Northwestern Stove Repair Co.

662 West Roosevelt Road, Chicago, Ill.

Manufacturers of Furnace, Boiler and Stove Repair Parts

GE

THERE IS NO SUBSTITUTE FOR QUALITY

WARM AIR
GILTEDGE
FURNACES

Blowers
Air Conditioners

Stokers
Incinerators

Write for prices and literature

Schwab Furnace and Mfg. Co.

Milwaukee, Wisc.

Cedar Grove, Wisc.

great extent for sales work. It is lots easier to hire office help than to hire good salesmen. The homeowner would always rather talk to the boss than to the hired man. The boss can close sales more quickly. I urge every dealer most earnestly to make himself his own chief salesman or sales manager. Let me caution you against letting the manufacturer or the jobber from whom you buy your heating equipment do your selling for you. Also let me caution you against branching out into allied businesses about which you know very little. You are always better equipped to do work with which you are familiar than to undertake new work that you are unacquainted with."

Federal Housing and Potential Home Owners

Speaking on the general subject of F. H. A. cooperation with our particular industry, Gale Sullivan, F. H. A. State Director for Illinois, made the interesting assertion that there are now 625,000 trailers on the roads of the country, each trailer representing a family which is footloose and no longer a home owner. Basing his assertion upon his experiences with F. H. A. homeowners, Mr. Sullivan declared that air conditioning must be sold in terms the public understands and not in technical phraseology. Also, this industry should remember, Mr. Sullivan said, that 72 per cent of the population earns less than \$2,500 a year, and air conditioning for the \$2,500 a year income must be considerably cheaper than present prices. Mr. Sullivan explained that Title I of the Federal Housing Act has only three and one-half months of life, but that Title II is just starting and that all officials in F. H. A. anticipate a building boom.

Advises Washington Annual Industry Meeting

Arthur P. Lamneck, Congressman from Ohio and former member of the industry, in one of the most interesting addresses of the convention, declared among other startling things that—"I believe every industry should have at least one meeting a year in Washington primarily for the purpose of discussing laws, legislation, and trends which definitely affect all industries."

Mr. Lamneck said that during the first Roosevelt administration probably every industry known in the country was in Washington crying for help, so the government was compelled to jump in and aid all kinds of industries. The government first helped the banks and printed some 40 billions of dollars to meet the expected run on the banks when they were re-opened. However, only 5 millions of dollars were demanded. The remainder of the forty billions of dollars of paper money remain in the vault in Washington unused.

Next the government loaned billions of dollars to banks and bought stock in banks large and small throughout the country. In addition to decreasing the gold content of the dollar the government borrowed money by issuing bonds which were bought principally by banks in which the government had stock. As a result of these financial operations the

Every Selling FEATURE *plus...* VERNALLOY



... and Vernalloy is indeed a powerful selling feature all by itself. That it will last 1½ times as long as ordinary cast iron was proven in the "Hell on Earth Test" ... and if you are not a Vernois dealer and have not been using this colorful and convincing test as a selling feature you have been missing many sales. Vernois is also a perfectly engineered furnace, that possesses many outstanding and extraordinary features. Features that mean easier operation, reduction of fuel costs, and much greater durability to your customer.

Many aggressive dealers throughout the country have more than doubled their business by lining up with Vernois. If you don't know what ... Vernalloy ... "Hell on Earth Test" ... Vernois ... are all about, now is the time to find out. We know it will mean many additional installations and greater profits for you in 1937.



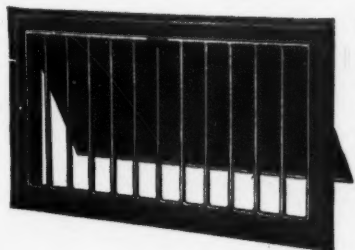
MT. VERNON FURNACE & MANUFACTURING COMPANY

Stoves—Ranges—Furnaces

MT. VERNON

ILLINOIS

Rock Island Registers



There is a Rock Island Register or Air Face to meet all Air Conditioning and Heating requirements and satisfy every taste. Beauty and utility form a happy and desirable combination in every item in the line. Rock Island Registers are easily installed, and every installation brings worth while profit. Rock Island can help you establish a reputation as a better heating contractor.



FREE ESTIMATING BOOK



This valuable book gives you the net cost of individual runs of warm-air and cold-air pipe for quick estimating. Also net prices on all registers, piping and supplies. Up-to-the-minute information and prices on blowers and forced-air jobs, with valuable tables. You may obtain this helpful reference book without any obligation whatever if you will send coupon.

**ROCK ISLAND
REGISTER CO.**
Rock Island, Ill.

Mail free estimating book without obligation to

Name

Address

Federal Treasury has sixteen billions of bonds in the hands of banks and we have therefore the greatest possibilities for credit inflation that the world has ever seen.

Declaring that one thing he does not favor is the collection of taxes from wealthy states and the payment of large sums of money to states who pay very little in the way of Federal Taxes, Mr. Lamneck said that the only way in which this situation can be remedied is through uniform condemnation of the procedure by citizens in those states paying high taxes. "It is not advisable, nor do I agree, that it is fair to tax any one group of citizens to pay money to other groups," declared Congressman Lamneck.

"I have noted with interest, during my six years in Washington, the fact that most business men do not appear in Washington either to watch legislation or to offer advice and suggestions nor to condemn legislation with which they do not agree. On the other hand, those industries and factions of the population with axes to grind are active in Washington 365 days in a year. Legitimate business cannot hope to compete with these factions who are thoroughly organized to advance the particular aims of their organizations.

The Social Security Act

"I believe that Social Security is here to stay. Certainly so long as twenty-five millions of people need help we will have something approaching

Social Security as a means of eliminating the uncertainties of unemployment, old age dependency, and all of the ills which we have seen so vividly during the past six years. So long as business refuses to hire men 38, 40 and 45 years old there is bound to be very serious unemployment and it will be necessary either for industry to give the employment to these older men or be taxed for their support.

"The Social Security Act to which so many people are objecting is only the beginning, in my estimation, of numerous laws of this particular kind. There are moves on foot to increase Federal taxation and as you all know there will be similar moves made by states, counties, and cities to likewise increase their taxation rates. As set up at present the Social Security Act is only a beginning. Imagine if you will how inadequate would be the sixteen weeks of unemployment payment to unemployed persons in times of a depression like the one we are just leaving when unemployment was a matter of months and years—not weeks.

Fair Conduct Rules and Regulations

"Many business men fear that NRA or some form of government control approaching the original NRA will be enacted during the coming session of Congress. It seems most likely to me that some such law will be passed and I myself propose to introduce a bill permitting an industry to set up rules and regulations of fair conduct and compelling all other members of the industry to abide by these

NU DRY FURNACE CEMENT

NuDry Furnace Cement is ideal for winter jobs and prevents smoking joints.

NuDry is best because it comes to you in dry form, takes less material to set a furnace, DOES NOT CRACK, POWDER OR BLOAT WHEN FURNACE IS FIRED IMMEDIATELY AFTER APPLIED, will not shrink, keeps joints tight at all

times, withstands high temperatures, and is not affected by temperature changes. It will not harden in containers and generally requires only half the usual amount of cement to complete a job.

Check the following jobbers and furnace manufacturers for your nearest supply of NuDry.

Akron, Ohio.
XXth Century Heating and Ventilating Co.
Baltimore, Md.
Wanner Brothers
Buffalo, N. Y.
J. M. & L. A. Osborn Co.
Cincinnati, Ohio.
Cincinnati Stamping Co.
Huenefeld Co.
C. H. Schrader Co.
Cleveland, Ohio.
Decker-Reichert Steel Co.
Forest City Foundries Co.
Henry Furnace & Foundry Co.
J. Kinsner & Sons Co.
Ohio Sanitary Specialty Co.
J. M. & L. A. Osborn Co.
Columbus, Ohio.
Munkle Heating Co.
Vorys Brothers, Inc.

Dayton, Ohio.
Direct Plumbing Co.
Detroit, Mich.
Detroit Safety Furnace Pipe Co.
Ideal Furnace Co.
J. M. & L. A. Osborn Co.
Erie, Pa.
Erie Concrete & Steel Supply Co.
Milloy Lumber Co.
Fort Wayne, Ind.
Wayne Pattern & Foundry Co.
Grand Rapids, Mich.
Behler & Young Co.
W. C. Hopson & Co.
Peoria, Ill.
F. Meyer & Bro. Co.
Philadelphia, Pa.
Central Stove Repair & Foundry Co.
Fox Foundry & Supply Co.
McMullen-Weber, Inc.

Pittsburgh, Pa.
W. F. Angermeyer Co.
Berger Supply Co.
Demmler Brothers Co.
Follansbee Brothers Co.
Henry Furnace & Foundry Co.
A. H. Johnson Company.
Pittsburgh Furnace Parts Co.
Proie Brothers Furnace Co.
San-A-Tor Furnace Supply Co.
Shamblen Furnace Parts Co.
Ravenna, Ohio.
Ravenna Furnace & Heating Co.
St. Louis, Mo.
A. G. Brauer Supply Co.
Hammond Sheet Metal Co.
Toledo, Ohio.
C. F. Throm & Sons.

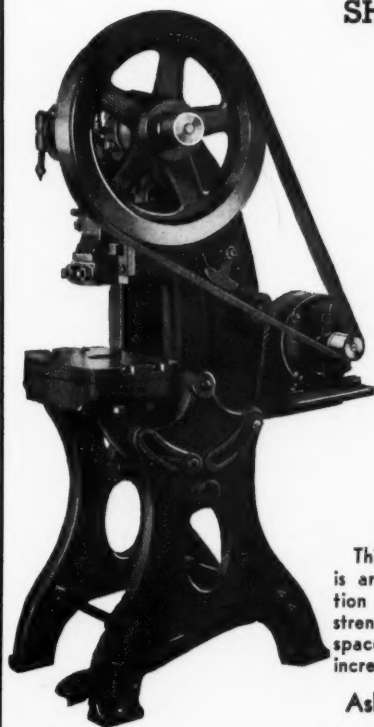
THE PYROLITE PRODUCTS COMPANY

1221-31 W. 74TH ST., CLEVELAND, O.

★★★ The MARSHALLTOWN Line ★★★

PRESSES—Capacities from 10 ton to 70 ton.

SHEARS—Capacities 18 gauge to 1/2" plate.



**No. 116
THROAT SHEAR**

Is especially designed
for Cutting Inside Cir-
cles and Irregular
Shapes.

**No. 2
PRESS**

This ruggedly constructed Press
is arranged with proper distribu-
tion of weight giving maximum
strength and affording ample die
space, low operating cost and
increased output.

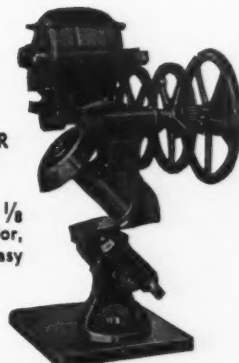
Ask Your Jobber or Write

Marshalltown Manufacturing Co.
MARSHALLTOWN IOWA



**No. 18
MOTOR POWER
THROATLESS
SHEAR**

Complete with 1/2
HP standard motor,
self-feeding and easy
to operate.

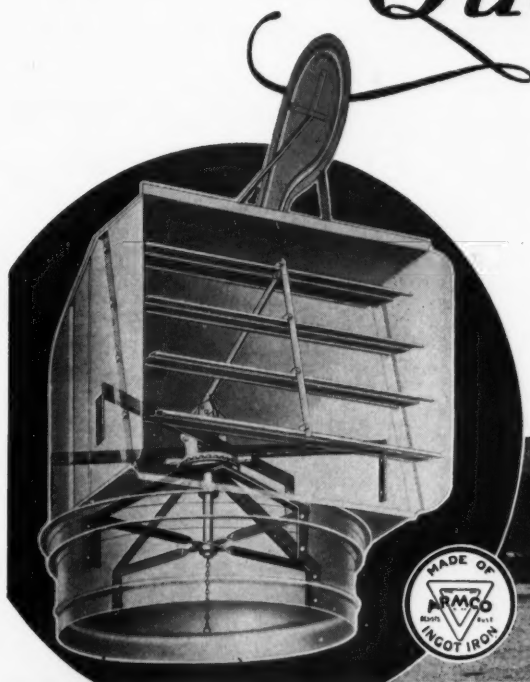


**No. 18
HAND POWER
THROATLESS SHEAR**

For irregular cutting
or straight splitting of
18 gauge sheets or
lighter. Will cut sheets
of any dimensions.



Quality Counts!



Quality TALKS quality—not only for the product itself—but also for YOU, the one that recommends, sells, and installs it.

Long after the initial cost is forgotten, a Swartwout Rotary (the QUALITY ventilator) will be talking—through its 100% performance—your good judgment, dependability and progressiveness.

Quality counts because it means the elimination of complaints, comebacks and adjustments.

Quality counts because it assures future business and profits through satisfied customers.

Make quality count for YOU by recommending and installing the Swartwout Rotary Ventilator. Catalog sent on request.

THE SWARTWOUT COMPANY
18615 Euclid Ave., Cleveland, Ohio



IT PAYS TO RECOMMEND AND INSTALL QUALITY
Swartwout ROTARY
BRONZE BALL
BEARING **Ventilators**

rules and regulations under policing by the Federal Trade Commission.

"There are in Congress at the present time many members with Communistic and Socialistic inclinations. Many of these members will be only too glad to see the so called capitalistic system destroyed. These members will probably leave no stone unturned to secure the type of Socialistic or Communistic government which they deem better than the one we live under at present. In my judgment it will be up to the American business man to set up rules and regulations of fair conduct so that every one in industry will be satisfied, will have a fair wage and some form of social insurance for old age and unemployment.

"I go on record as favoring the Robinson-Patman bill. I did not favor this bill when it was first introduced, but upon careful study I am convinced that the Robinson-Patman bill has no intention of prohibiting men from running their own business; selling to any individual he selects; at prices he deems fair and reasonable so long as he sells above cost and to all individuals on a like basis. I am convinced that the regulation of the Robinson-Patman bill and those governmental agencies which will enforce the law have no intention of making this act a limiting agency on legitimate business. It was intended primarily (and has been so construed) as a law to eliminate unfair competition and we must all admit that there is unfair competition in practically every industry. Unfortunately, unfair

competition is fostered principally by the 10 per cent of any one industry who are not concerned with the general betterment of that industry, but are concerned only with the immediate profits they can see.

"I predict that unless some act, such as the Robinson-Patman bill, is applied to industry all business will be operated by large financial institutions hundreds of miles away from the actual operation within fifty years."

Co-operative Advertising

At the entertainment and luncheon given to attending members by the trade in Chicago, Gordon Best, of Chicago, explained the benefits of cooperative advertising in terms of successful campaigns conducted by other industries and of special interest to those attending was a sample 15 minute radio program reproduced by means of phonographic transcription. The sentiment of members was summed up by Bennett Chapple, "I believe that this industry is contemplating the greatest single thing that has ever happened to the furnace industry in considering cooperative advertising. Speaking from experience I say that radio will help to do the job. Other industries have had notable success with cooperative radio advertising and there is no reason why the warm air heating and air conditioning business cannot likewise endure a profitable advertising campaign.

Louis Dreihoble, President of the Furnace and Sheet Metal Institute and Paul M. Barth, chairman of the Central Committee, Chicago, in short talks, explained why Chicago contractors are advocating cooperative ad-

W. A. WHITNEY MFG. COMPANY

636 RACE STREET

ROCKFORD, ILLINOIS

Look for this mark when buying



NO. 1 HEAVY DUTY PUNCH

Length 34", weight 22 lbs., well distributed to nicely balance the tool. Capacity $\frac{3}{8}$ " hole through $\frac{1}{4}$ " iron. Heavily reinforced for strains. Punches and dies $\frac{1}{8}$ " to $\frac{3}{8}$ " by $\frac{1}{4}$ ". Insertable Pipe Handles.



CHANNEL IRON PUNCH

Every part of this Punch is interchangeable with the No. 2. Length 23", weight 16½ lbs. Depth of throat 1½". Capacity $\frac{1}{4}$ " through $\frac{1}{4}$ " iron. Punches and dies $\frac{1}{8}$ " to $\frac{3}{8}$ " by $\frac{1}{4}$ ".



NO. 6 FLANGE PUNCH

Punches within $\frac{3}{4}$ " of inside corner of Angle Iron. Capacity $\frac{1}{4}$ " through $\frac{1}{4}$ " iron. Depth of throat 1½", throat opening width $\frac{1}{2}$ " above die top. Punches and dies $\frac{1}{8}$ " to $\frac{3}{8}$ " by $\frac{1}{4}$ ". Especially adapted for Button Punching. Weight—10 lbs.

Channel Iron

2½" Flange x ¼" Web.



NO. 91 BENCH PUNCH

Capacity $\frac{3}{8}$ " hole through $\frac{1}{4}$ " iron, 1" hole through $\frac{3}{8}$ " iron, 2" hole through $\frac{1}{2}$ " iron. Weight 82 lbs. Depth of throat 5". Stock size of punches and dies $\frac{1}{8}$ " to 2".

EXTRA PUNCHES and DIES

Prompt shipments can be made of any size or any quantity of both types of extra punches and dies as here shown.

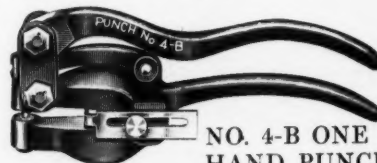
Angle Iron

2½" x 2½" x ¼".



NO. 2 PUNCH

Length 23". Capacity $\frac{5}{8}$ " through $\frac{1}{4}$ " iron. weight 13 lbs., depth of throat 1½". Punches and dies $\frac{1}{8}$ " to $\frac{1}{2}$ " by $\frac{1}{4}$ ".



NO. 4-B ONE HAND PUNCH

Length 8½". Capacity $\frac{1}{4}$ " through 16 gauge iron. Weight 3 lbs. Depth of throat 2". Punches and dies $\frac{1}{8}$ " to $\frac{3}{8}$ " by $\frac{1}{4}$ ".



NO. 8 PUNCH AND VISE

Capacity $\frac{1}{4}$ " hole through $\frac{1}{4}$ " iron. Length 18½", weight 7½ lbs. Depth of throat 2". Stock size of punches $\frac{1}{8}$ " to $\frac{1}{4}$ " by $\frac{1}{4}$ ". Punch Vise as shown above—holding our No. 8 punch. Weight 5 lbs. Made of Malleable Iron. Bolts to bench or plank. Capable of holding any of our punches.

✓ Check the Extras

THE EXTRAS are the superior features found only in **LACLEDE FURNACE CEMENT**

✓ **DRIES FASTER**

Fire the Furnace Immediately

✓ **SETS STRONGER**

Air & gas-tight joint that stays tight

✓ **LASTS LONGER**

Withstands heat better than cast iron

Free **YOU BE THE JUDGE**
 Definite proof of superiority can be readily established in an impartial test
SEND FOR FREE SAMPLE

LACLEDE-CHRISTY CLAY PRODUCTS CO.

MAKERS OF FINE HEAT RESISTING PRODUCTS SINCE 1844

411 N. SEVENTH ST.

ST. LOUIS, MO.

THE GRAND RAPIDS FURNACE CLEANER IS A NECESSARY TOOL TO SERVICE YOUR CUSTOMERS HEATING PLANTS

It also sells heating equipment—Repairs—and other merchandise and gives you a steady daily cash income.



It is the **POWERFUL—STURDY—REFINED and POLISHED—ONE-MAN FURNACE CLEANER.**

FREE TRIAL—with no strings attached.

CONVENIENT TERMS—pay as you earn. "A Plan to Increase Your Sales" that works—not an arm-chair theory—goes with the machine.

Unbelievably **LOW PRICED.**

Write for Details

GRAND RAPIDS FURNACE CLEANER COMPANY
 Grand Rapids, Michigan



YOUR GUARANTEE OF ... QUALITY

The Famous Favorite trade mark is truly a sign of quality. Not only does it distinguish the Favorite Hermetic Furnace from the ordinary unit, but it also marks the dealer as a man of integrity and fair dealing with his customers.

This is how you can turn the Favorite trade mark to your advantage on all new furnace or repair jobs . . . we have a complete up to date line of repair parts with which you can make dependable, trouble-free repairs and a fuel-saving, strongly-constructed furnace to clinch and perform those new furnace installations.

Write us today for our literature and repair catalog. The Favorite trade mark will help you make money in 1937.

FAVORITE STOVE CO.
 PIQUA OHIO

HIGH SPEED SHEARING

Of Irregular Shapes
 — Splitting —
 Ring and Circle
 Cutting



The ideal shear for sheet metal work—absolutely accurate and easily operated metal is sheared and not punched cut anywhere, no starting holes required for inside cutting only one adjustment for various thicknesses of material used material does not feed itself by action of the cutters unobstructed cutting vision no further finishing required. No special cutters, pilots, templates, or strippers are needed long life shear blades. Standard equipment furnished for splitting sheets, ring and circle cutting. Write for complete information.

LIBERT MACHINE CO.

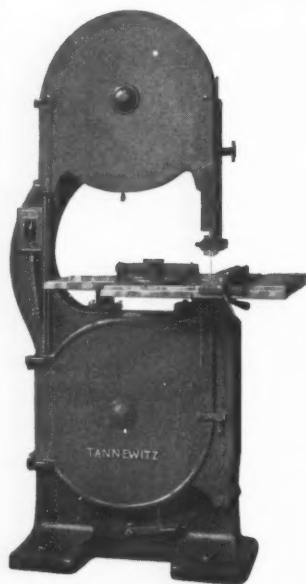
Green Bay, Wisconsin

Manufacturers of shears since 1915

Libert Method

TANNEWITZ HIGH SPEED BAND SAWS

For Sheet Metal Cutting



Made in Four Sizes
24" 30" 36" 42"

These band saws are sturdily made to operate at great speed which permits sheet steel to be cut surprisingly fast. Also light bars, and shapes.

Send for Prices

THE TANNEWITZ WORKS
GRAND RAPIDS, MICH.

PREMIER FURNACE CLEANERS

ONE HORSE POWER MODELS \$79.50 and \$84.00
HALF HORSE POWER MODELS \$55.00 and \$59.50
COMPLETELY EQUIPPED

Premier Furnace Cleaners are powerful and light weight, yet sturdily built to stand years of rugged service. Weighing less than 50 pounds, they are one-man cleaners and have been the furnace man's favorite for years.



Premier Cleaners are ideal for up-stairs use and may be used independently from the container for suction and blowing use in cleaning air ducts, registers, grills, radiators and air conditioning equipment.

Motor specifications for these powerful cleaners are:
1 H.P. maximum vacuum 46 inches in water.
½ H.P. maximum vacuum 31 inches in water.

**BUSINESS-GETTING, RETURN POST CARDS
ARE AVAILABLE FOR DEALERS AT LOW COST**

Buy It From Your Local Jobber or Write the
Manufacturer

**FURNACE CLEANING INSTRUCTION BOOKLET
FREE WITH EACH CLEANER**

ELECTRIC VACUUM CLEANER CO., INC.
1734 Ivanhoe Road • Cleveland, Ohio

vertising and urged the association to adopt some form of publicity.

New Mechanical Heating Code

At the afternoon session Professor J. D. Hoffman submitted his report on the New Mechanical Heating Code and stated that this code was not ready for final presentation to the association. Professor Hoffman said many points have yet to be ironed out and the exact phraseology of the code has to be determined.

Chairman Sedgwick of the Research Advisory Committee did not outline the work of the committee during 1936 as customary, but said that the proposed test program is to be printed and copies sent to all members.

Professor A. P. Kratz presented a discussion of "The Calculation of Cooling Load for Installation of Summer Cooling Systems," illustrating his remarks by means of suitable slides reproduced from University of Illinois Experiment Station bulletins and research data. Professor Kratz's address will be covered in a future issue of American Artisan.

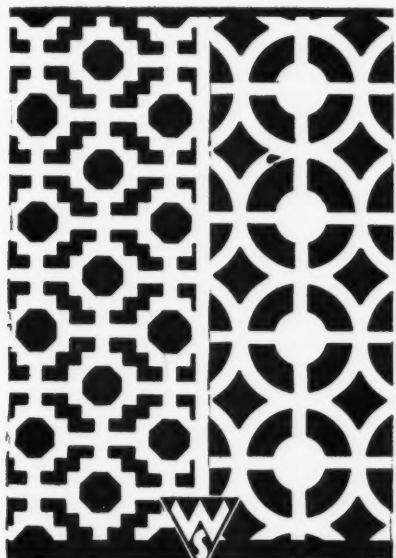
Summer Cooling

S. Konzo, speaking on the subject "Summer Cooling in the Research Residence Using Water at 52 Degrees F. and 46 Degrees F.," outlined the various cooling tests which have been run to date in the Research Residence and gave figures on means of operating a cold water cooling system and the cost to be expected. Mr. Konzo stated that a bulletin on water cooling will be ready for publication by summer. A series of articles covering cooling in the Research Residence has been published previously in American Artisan and future articles covering the use of city and well water will appear during the coming spring and summer.

Combined Salesmanship and Engineering Imperative

Frank G. Herman, of Oshkosh, Wisconsin, addressing the convention Thursday morning on the subject "Combined Salesmanship and Engineering Imperative," declared that too often the common attitude of the dealer is "There She Be," and that the attitude of the home owner is "Damned If She Ain't." On this basis, said Mr. Herman, there seems to be no legitimate means of getting the dealer and the home owner together. Such an attitude, declared the speaker, indicates a lack of education and information (ignorance in other words) on the part of both the dealer and the home owner. Too often the dealer is simply repeating phrases which he has learned from his manufacturer or jobber and the home owner is simply talking about things which he does not understand.

Because this situation exists, Mr. Herman suggested that sales should be made from an engineering basis rather than by high pressure selling. As a means of educating dealers, Mr. Herman suggested small conventions within the main convention where a little group of dealers could get



NEW DESIGNS

Increased free air openings and greater concealment are important features of the new Wissco designs in decorative perforated metals. A new folder showing them as well as all other of the popular Wickwire designs is now ready. Send for a copy.



WICKWIRE SPENCER STEEL COMPANY

New York City Worcester Buffalo Chicago San Francisco

WICKWIRE SPENCER
perforated metals



Boomer Boiler Plate Furnaces

Also made with duplex grates and upright shaker.

Have been successfully made for 23 years. Where introduced have given satisfactory service. The fire pot liners are the best we can buy and we know of several Boomers that still have the original liners in, which are 23 years old. We have been making cast iron Boomers for 50 years.

If you are interested in selling a strictly high grade furnace, ask for prices and agency.

Nothing but the best of material enters into the making of Boomers.

When repairs are needed, avoid risk of dissatisfaction by ordering direct from the original patterns. Prices are low.

We sell to legitimate dealers only.

THE HESS-SNYDER CO., MFRS.
Massillon, Ohio

IT'S ... HEADQUARTERS!

FOR ...

Repair parts to fit all stoves,
furnaces, boilers, or oil stoves.
Furnaces, Pipe, Fittings, etc.
Air Conditioning Blowers, Fil-
ters, Controls, Humidifiers.

In fact it's headquarters for
everything you need, made
of only the finest materials.

WRITE FOR COMPLETE
INFORMATION

CENTRAL FURNACE & STOVE REPAIR COMPANY

3937 OLIVE STREET

ST. LOUIS, MISSOURI

**W
A
L
S
H
P
R
O
D
U
C
T
S**



WALSH ASBESTOS FURNACE CEMENT

Assures satisfactory furnace installations and repairs. Packed in 1, 2, 3, 5, 8 and 10 pound cans . . . also 25, 50, 100, 250, and 500 pound steel drums.

WALSH HEARTH MIX

A superior monolithic refractory for moderate heat duty. For poured linings, special shapes, oil burner hearths, etc. Packed in 50 and 100 pound heavy bags.

WARCO FURNACE LININGS

Highly refractory . . . uniform in size and shape . . . possessing excellent resistance to abrasion and extremely smooth surface.

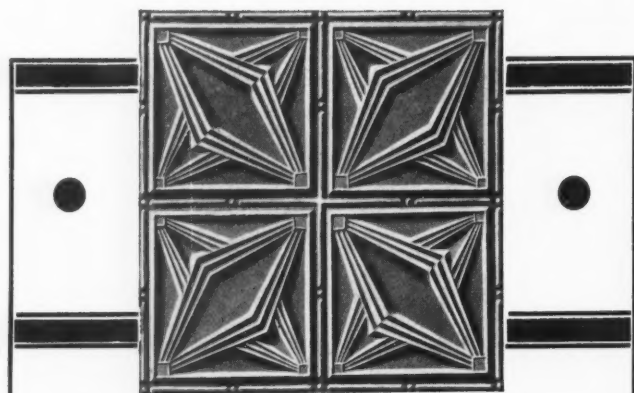
WALSH PLASTIC FURNACE LINING

A high heat resisting fire brick in plastic form, ready for use, with outstanding working, drying and burning properties. Used extensively for repairing broken, cracked and burned-out fire pots. Packed in 5 and 10 lb. cans; 25, 50, 100, 150 and 500 lb. drums.

Walsh Refractories Corporation

4430 North First Street

St. Louis, Mo.



ATTRACTIVE • ENDURING

Besides adding an attractive appearance to any room, Canton Steel Ceilings are long lived and easily maintained. No checking or cracking and the owner will never have a damage suit as a result of falling plaster.

There are many selling points besides these, and you have only to explain them to your prospects to clinch those steel ceiling installations. The Canton line will put money in your pocket all year round.

Write now for full particulars and get ready to push this profit-maker throughout 1937.

Sold through all leading Sheet Metal jobbers.

CANTON STEEL CEILING COMPANY

2280 WINFIELD WAY, S. E.

CANTON, OHIO

Warehouse Service: 497 West Street, New York City, and Canton, Ohio

Now,
men,
you can have
a Practical Crimper!



CHAMPION DRAW ACTION PIPE CRIMPER

Length—14 Inches. Weight—one lb. 10 ozs.

Crimps plain round, square and rectangular pipe—quickly, perfectly and easily. Can be used in the shop or carried conveniently in the tool kit to outside jobs. Appreciated by those who install warm air furnace pipe, wall stacks, air ducts, smoke, conductor and water heater vent pipe, etc. Price \$2.50 f. o. b. Factory.

Jobbers and Installers: Write for full details to-day.

CHAMPION TOOL COMPANY

356 West 91st Street, Los Angeles, California

YOU CAN DOUBLE YOUR BUSINESS THIS WINTER



WITH The TORNADO Furnace Cleaner

The TORNADO gets you into the basement where it is easy to sell repairs and new furnaces. And you make a profit on the cleaning job too!

The TORNADO is the most powerful furnace cleaner built. Leads the field! Low price—easy payments—free trial. Approved by Anthracite Institute and Underwriters Lab. Thousands in use. Write now for complete information.

Breuer Electric Mfg. Co.
865 Blackhawk Street, Chicago, Ill.

together with trained engineers and trained sales executives and have explained to them the fundamental principles of engineering and salesmanship.

The question is often asked, said Mr. Herman, "Who is in Air Conditioning?" and the answer is "Everyone." The reason why everyone is in air conditioning is that all industries are looking to air conditioning as one means of skimming the cream off a new bottle. Industries having nothing in common with air conditioning but well financed and looking for new products to manufacture and sell, see in air conditioning an industry up and coming and now enjoying popular acceptance. "We have not yet seen an influx into this industry such as will be with us during the next five or ten years."

"Dealers want and will accept education in design, service and installation and as the dealer learns he will, in turn, remove much of the present work of education and assistance from the manufacturer and jobber. The biggest problem today is to keep air conditioning in the warm air heating business."

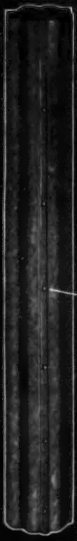
Servicing Today Is a New Problem

Frank L. Meyers of Toledo, Ohio, speaking on the subject, "Servicing Today Is a New Problem," declared that in years past the road of sales was very straight and very simple being from manufacturer to dealer to consumer. Then into the warm air heating and air conditioning picture stepped the oil burner, the gas burner and the stoker manufacturer and sales agency to complicate the sales and service picture. Each equipment manufacturer or sales agency serviced its own apparatus and the consumer found the result of such a system absolutely unsatisfactory.

The oil burner dealer blamed the fuel distributor or the furnace man and the furnace man in turn placed the blame upon the blower manufacturer or the filter manufacturer or the oil burner manufacturer, leaving, in the end, the home owner uncertain as to who was responsible for a job which did not function as intended.

Mr. Meyers suggested that perhaps a super service system is not outside of reason. In those communities where mechanical warm air heating and air conditioning is making rapid headway there should be opportunity for such a super service agency capable of trouble shooting all types of systems and recommending changes or checking incorrect design made by anyone of the manufacturers or dealers contributing equipment to the final installation.

"Service always starts with sales and if my facts are true the furnace up to date has literally sold itself," declared Mr. Meyers. "Manufacturers of furnaces have had to learn about blowers, filters, controls and other accessory apparatus, but despite the manufacturer's willingness to learn, the demand for equipment has grown so rapidly that much apparatus now on the market has been produced with little thought toward the final operation. Service has been one of the major problems of the automobile, the radio, and the refrigeration industry so how



"BB"
The Mark
of
Quality

Seam
Locked
Every
Few
Inches

BERGER BROTHERS CO.
229-237 Arch Street, Philadelphia, Pa.

EAVES TROUGH
GUTTER HANGERS
CONDUCTOR FASTENERS
MITRES
END PIECES AND CAPS
CONDUCTOR HEADS
ORNAMENTAL STRAPS
VENTILATORS, ETC.

"Shur-Lock"
Pipe

Write for catalog of the "BB" Line
Buy from your jobber

PERFORATED METALS
Industrial and Ornamental



ANY METAL • ANY PERFORATION

Industrial Perforations include all sizes of round, oblong, and many special shaped perforations, for Screening, Grading, Draining and Guarding purposes. Our line is very complete.

Ornamental Perforations are used in Architectural Grilles, Radiator Enclosures, Metal Furniture, Cabinets, Stoves, etc. In addition to the standard shapes we have many exclusive and attractive designs suitable for different uses.

H&K workmanship is unsurpassed.
Write for prices and other information.

The Harrington & King
PERFORATING CO.

5649 Fillmore St., Chicago, Ill.

New York Office, 114 Liberty St.

PERFECT REPAIRS

are assured when CAPITOL parts are used . . .
everything to fit the furnace—firepots, grates, bars.

Our Catalogue will
convince you that--
CAPITOL HAS IT!

CAPITOL FURNACE & STOVE REPAIR CO.

229 S. Meridian, Indianapolis, Ind.



CHRISTIE
FURNACE VACUUM
CLEANER

A One-Man
Super-Powered
Machine

\$99⁵⁰

(Subject to
Change Without
Notice)

F. O. B. Cincinnati
with Tools and
Attachments

This is the same high quality machine that is known to furnace dealers everywhere as the most powerful, one-man cleaner on the market. Built by practical furnace men.

Quantity production and large purchasing power enable us to make this sensationally low price. Includes tools and attachments. Folder "A" mailed upon request.

We also manufacture the "Christie Giant" to operate from truck or yard.

Sold by Jobbers and Furnace Manufacturers.

DISTRIBUTORS WANTED: Write for interesting proposition.

CHRISTIE CLEANER COMPANY

District of The Cincinnati Sheet Metal & Roofing Co.
226-30 East Front St.

Cincinnati, Ohio

WARD

SHEET METAL WORKING MACHINERY

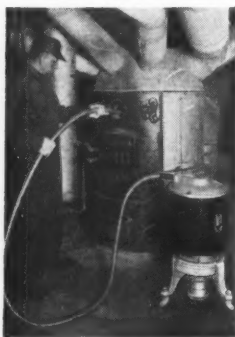
If it is a machine, tool or supply for the Sheet Metal Shop—We have it!
TRY WARD IN 1937

Your inquiries earnestly solicited.

564 W. Washington Blvd.

Chicago, Ill.

You Win THREE Ways! with a



KENT

Furnace Vacuum Cleaner

1. Extra money during the winter months.
2. No lay-offs with breakdowns—Kent is quality.
3. Gives you leads for replacement and new business.

Double Suction—Twice the Power—
One-Man Unit

THE KENT CO., Inc.
Rome, N. Y.

ACME "Hot Spot" WELDERS

Universally accepted as the sturdiest, easiest handled, most economical electric Spot Welder on the market.

Write for literature and prices

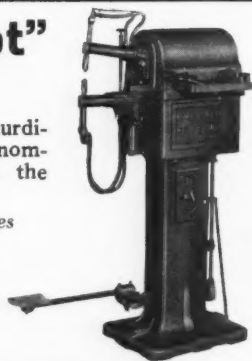
**Don't Rivet
SPOTWELD!
with an ACME**
Lifetime Guarantee!

Complete range of sizes

ACME ELECTRIC WELDER CO.

Warehouses in principal cities

5619 Pacific Blvd.



Huntington Park, Calif.
(Los Angeles County)

Ask for ... **BURNLEY** TRADE MARK

SOLDERING PASTE
SOLDERING SALTS
SOLDERING STICK
SOLDERING .. SOLUTION
PIPE JOINT COMPOUND

Burnley Battery & Mfg. Co., North East, Pa.

can we expect a much more complicated apparatus such as residential air conditioning to survive without encountering service problems of greater magnitude than those encountered by any of the industries mentioned. Air conditioning and even mechanical heating is not a plug-in proposition. The manufacturer, the jobber and the dealer, must work cooperatively to the end that service can be guaranteed the consumer. Unless we, as an industry, solve satisfactorily this problem of service, we will find that air conditioning and mechanical warm air heating sales are greatly curtailed and that the present public acceptance will die away."

Summer Cooling

G. D. Leiter of Ashland, Ohio, addressing the convention on "Summer Cooling Using Well Water," declared that in his estimation one of the major jobs yet to be done is to acquaint the public with the actual functions of an air conditioning system. "The public must be made to understand that there is Summer air conditioning, Winter air conditioning and year around air conditioning and that unless the exact functions are specified, dissatisfaction will result. Mr. Leiter recommended that the functions of air conditioning as set forth in the A. S. H. V. E. Guide be used by this industry.

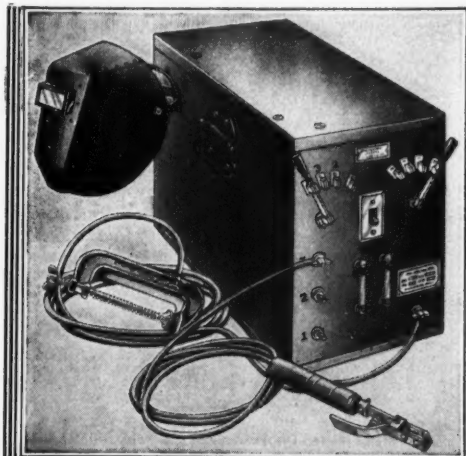
Mr. Leiter declared that in his experience well water is probably the lowest in cost of all methods of summer cooling so far as the cost of the medium is concerned. Where water temperatures are low, water cooling never exceeds 20 per cent of the cost of mechanical refrigeration. There are fewer controls and consequently less service and less maintenance involved in water cooling than with cooling of other types. Even water used for cooling need not be wasted but can be used for watering the lawn or other domestic purposes.

With a warm air heating system having a furnace, fan, filter and ducts for distributing the air, the only additional apparatus required for summer water cooling is a coil, a pump and the necessary piping. Water can be taken from a well or from the city water supply if such water is cold enough, circulated through the coil by means of the pump and used for domestic purposes. The cold water passing through the coil reduces the temperature of the air and also dehumidifies thus producing cool and dry air in the rooms of the house.

Mr. Leiter recommended that coils be used rather than sprays, since sprays tend to increased relative humidity and thus produce an unsatisfactory interior condition, whereas coils do not raise the humidity.

1937 Officers and Directors

In addition to re-electing the officers of 1936 to serve during 1937, the Board of Directors remains the same with the exception of Cliff Ackerson of Agricola Furnace Company to replace Frank Mehrings and H. Allen of Marshall Furnace Company to replace D. E. Dobbins, of the same company. The next meeting of the association to be held in June, 1937, will be in Cleveland.



INCREASE PROFITS — SAVE TIME ON JOBS with a

No. 300 VULCAN ELECTRIC ARC WELDER

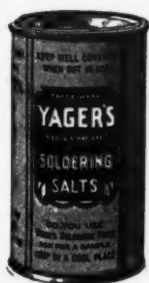
• BUILT FOR THE SHEET METAL FIELD •

The VULCAN portable welder is a strong, substantial welding machine especially suited for sheet metal men who do welding on the job. Will operate off a 110 or 220 AC volt line. Air conditioning furnace installations and ornamental and structural iron jobs can be done much faster and cheaper with a VULCAN, as it will weld steel, cast-iron, or anything that can be electrically welded. Take it right to the job and put it to work. Equipment includes fifteen feet of welding cable with terminal and welding rod holder. Twelve feet of ground cable and one Helmet type eye shield. The No. 300 VULCAN portable arc welder should be in every sheet metal shop . . . and we've priced it low enough so that you can afford it.

• Complete with all equipment—\$147.50 •

Write NOW for details.

**VULCAN ARC WELDER MFG. CO., 2636 OLIVE STREET
ST. LOUIS, MO.**



YAGER'S Soldering Salts FOR ALL SHEET METAL SOLDERING

Packed in 1/2 lb., 1 lb., 5 lb., 25 lb. and 50 lb. cans

AT YOUR JOBBER OR WRITE US

ALEX. R. BENSON Co., Inc., Hudson, N. Y.

TO BE SURE—

Of Prompt Shipment—

Of the Best Metal—

That They Fit—



Order all repairs for every make of Furnace and Boiler from

**THE NATIONAL FOUNDRY & FURNACE CO.
DAYTON, OHIO**

PORTABLE SHEARS ALL-ALLOY



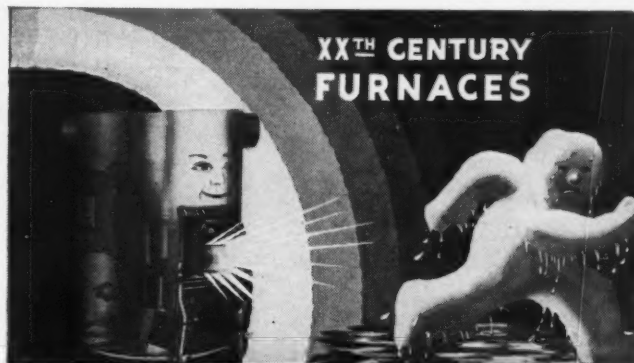
ALL-ALLOY No. 2 cuts up to 1/4" steel plate.

ALL-ALLOY No. 1 cuts up to No. 11 gauge strip or sheet.

Special blades may be had for shearing stainless steel.

FULLY GUARANTEED

BREMIL MFG. CO. Erie, Pa.



KEEP OLD MAN WINTER ON THE RUN

**XXTH CENTURY HEATING & VENTILATING CO.
AKRON, OHIO**

A Heat Hustler Fan Forces Air Through a Single Warm Air Pipe

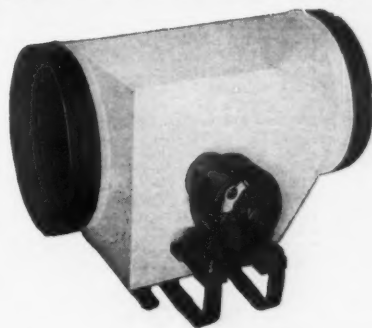
Heat garages, sun porches and other rooms that will not heat by gravity. Mounts directly in the warm air pipe. Draws heat from the furnace and forces it into the hard-to-heat room. Quick heat for a bathroom.

Four reasons why you should use the American Heat Hustler:

1. It uses a positive pressure, rotary type fan.
2. Motor is outside the warm air flow, adding greatly to life of motor and leaving as much space for gravity air flow as before the Heat Hustler was installed.
3. It is quiet.
4. Furnished for either automatic or manual control.

Price list, with descriptive literature showing different models, sizes, etc., will be sent you by return mail upon receipt of your request. **CLIP AND SEND THIS AD IN NOW!**

AMERICAN FOUNDRY & FURNACE COMPANY
Bloomington, World's largest manufacturers of blower furnace systems Illinois



Patented

● for Finishes of
unique individuality—

● ● *consult*

WATTENAMEL CO.
SUMMIT, ILL.

the home of modern industrial coatings

Specializing on Crackles

EQUALS

Every pound of pressure on the handle of a Viking produces 20 pounds at the blade. Viking's original compound lever arrangement does it. Choose a Viking for its strength, long

ONE POUND



TWENTY

life, easy handling and low cost.

The cutting blade, $\frac{1}{4}$ " thick, made of specially tempered high grade tool steel, keeps its edge for a remarkably long time and is easily replaceable. Write for complete details—buy from your jobber.

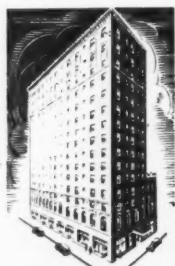
VIKING SHEAR CO. ERIE, PA.

THE HOTEL OF THE MONTH

Mark Twain
HOTEL
ST. LOUIS
MISSOURI

ALBERT

PICK
HOTELS



You'll get more for your money at Pick Hotels. Spacious, comfortable rooms. Delicious food and real personal service. All at moderate prices.

CHICAGO, ILL. GREAT NORTHERN HOTEL
DETROIT, MICHIGAN. TULLER HOTEL
DAYTON, OHIO. MIAMI HOTEL
COLUMBUS, OHIO. CHITTENDEN HOTEL
COLUMBUS, OHIO. FORT HAYES HOTEL
TOLEDO, OHIO. FORT MEIGS HOTEL
CINCINNATI, OHIO. FOUNTAIN SQUARE HOTEL
CANTON, OHIO. BELDEN HOTEL
INDIANAPOLIS, INDIANA. ANTLERS HOTEL
ANDERSON, INDIANA. ANDERSON HOTEL
TERRE HAUTE, INDIANA. TERRE HAUTE HOUSE
ASHLAND, KENTUCKY. VENTURA HOTEL
OWENSBORO, KENTUCKY. OWENSBORO HOTEL
JACKSON, TENNESSEE. NEW SOUTHERN HOTEL
ST. LOUIS, MO. MARK TWAIN HOTEL
WACO, TEXAS. RALEIGH HOTEL



THE WORD PICK SHOULD ALWAYS REMIND YOU OF ALBERT PICK HOTELS

HERO
FURNACE



FURNACES

CHALLENGE
FURNACE

Three trade marks in which you can place entire confidence when selecting a furnace . . . backed by an organization which has successfully manufactured and distributed high-grade warm air heating systems for over 35 YEARS.

Home of Genuine Repair Parts
Phone 385

STANDARD FOUNDRY & FURNACE CO.

DeKalb, Illinois

Strong, Neat Joints

FREE
SAMPLE

Rubyfluid, the perfect soldering flux, fluxes all metals quickly, without odor or corrosion and assures strong, neat joints of lasting durability. Available in liquid or paste flux, acid or rosin core solder. A test will prove it best.



RUBY CHEMICAL CO.

66 McDowell St.

Columbus, Ohio

Rubyfluid

KNOW AIR CONDITIONING

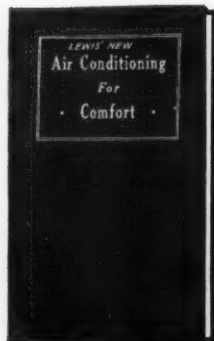
Learn every phase of this important subject by sending today for a copy of

**LEWIS' NEW
"Air Conditioning
for Comfort"**

by SAMUEL R. LEWIS

277 Pages—\$2.50

Large Psychrometric Chart



So understandably does this new volume cover all angles of air conditioning that already dozens of schools teaching air conditioning have adopted it as a text. From it anyone may quickly acquire a thorough knowledge of equipment, psychrometry, refrigeration, humidification, dehumidification, heat transmission, heat absorption, air distribution, and water circulation. It also explains every step in the design of a complete heating and cooling system for a typical residence and a typical commercial building.

Send \$2.50 for a copy today. You may return the book and your money will be refunded promptly if it does not prove satisfactory in every way.

KEENEY PUB. CO. • 6 N. MICHIGAN • CHICAGO

IRONSET

the Furnace and
Retort Cement

THAT IS
GUARANTEED
Not to crack, bloat,
shrink or blister

A Fireline Product—
Write for Circular

Fireline Stove & Furnace Lining Co., 1866-A, Kingsbury St., Chicago.



FURNACE BRUSHES—WIRE or FIBRE



ROUND STEEL WIRE BRUSH

Built for hardest use by trained artisans. Highest quality, oil tempered steel, double twisted wire stem. Special sizes to meet any requirement. Write for circular.

SCHAEFER BRUSH MFG. CO.
117 W. WALKER ST., MILWAUKEE, WIS.

SCHAEFER
GUARAN-
TEED

Which means,
that you must and
will be satisfied
with any SCHAE-
FER brush you
buy.

SCHAEFER BRUSHES
BUY SCHAEFER-IT'S SAFER

CLASSIFIED ADVERTISING

4 cents for each word including heading and address. Count seven words for keyed address. Minimum \$1.00 for each insertion. One inch \$3.00. Cash must accompany order. Copy should reach us eight days in advance of publication date. Display rates for this page will be furnished on request.

SITUATION OPEN

WANTED—Foreman for Sheet Metal Shop who understands warm air heating, air conditioning and roofing. PEKIN HARDWARE COMPANY, Pekin, Ill.

SALES ENGINEER WANTED: THE PREMIER FURNACE COMPANY will employ a man to fill an important position selling to dealers in an established, productive territory. The man wanted is young, experienced, and capable of engineering the average size heating and air conditioning installation. To the man meeting these qualifications Premier offers a splendid opportunity. APPLY BY LETTER ONLY—give a full report on yourself, in confidence, as references will not be approached without permission. A personal interview depends on the completeness of your application. PREMIER FURNACE COMPANY, BOX 150 DOWAGIAC, MICH.

SITUATIONS WANTED

SALES ENGINEERING EXECUTIVE: Competent to take hold of any department with manufacturer, or engage actively in sales with contractor. Fully qualified by years of broad experience in heating and air conditioning field. Address Key 390, "American Artisan," 6 N. Michigan Ave., Chicago.

MISCELLANEOUS

Patents and Trade Marks

Philip V. W. Peck

Barrister Bldg., Washington, D.C.

RIBBED WIRE GLASS—15c per sq. ft.

STOCK SHEETS, CASE LOTS, PLUS BOXING F. O. B. BUFFALO, N. Y. SHIPMENT TO ANY PART OF THE UNITED STATES QUOTATIONS ON ALL KINDS OF GLASS ON REQUEST

Write for Samples
T. J. ATCHESON GLASS CO.
953 Main St., Dept. A, Buffalo, N. Y.

WANTED: Someone with about One or Two Thousand Dollars to buy an interest in my Sheet Metal, Furnace and Roofing business in a thriving industrial Michigan city. Someone who understands the Furnace and Sheet Metal Work so that they could work and take full charge of the work as general superintendent. I would appreciate hearing from someone at once. If interested, address Key 389, "American Artisan," 6 N. Michigan Ave., Chicago.

FOR SALE

Sheet Metal Machines New and Really Rebuilt

A machine for every use and every machine is ready for use. The largest stock in Chicago. Ask for list.

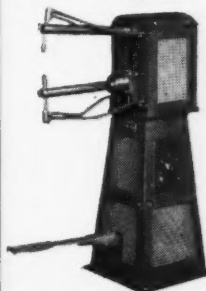
Complete supplies and tools.

MAPLEWOOD
MACHINERY CO., Inc.

Chicago

2634 W. Fullerton Ave. Brunswick 9200
561 W. Washington Blvd. State 1405

OUR CONTRIBUTION—TO MAKE— 1937—A PROSPEROUS NEW YEAR! "VALUE PLUS!"



Imagine An Opportunity to Buy a BRAND NEW 10 KVA Spot Welder with 18" arms, same as picture for ONLY—\$150.00!! Capacity—2 pieces 14 gauge and lighter. Write for descriptive circular at once! Subject to prior sale—immediate shipment from stock.

"Draw on the Most Complete Stock in America"
Machinery Co., Inc.
130 S. Clinton St., Chicago
(Free Parking)

FOR SALE: Fully equipped Sheet Metal Shop in Western town, doing good business. Owner wishes to retire. Terms and conditions can be arranged. Address A. DeLucchi, 225 E. Fourth St., Reno, Nevada.

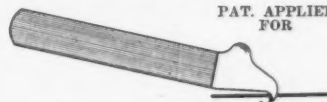
FOR SALE: Used vacuum furnace cleaners in good condition at reasonable prices. THE CARL E. SWIFT CORPORATION
Box 906, Holland, Michigan
Makers of the World's Largest Electric Power Suction Cleaner

Use AMERICAN ARTISAN Classified Advertising for quick results. It puts you in direct touch with the buyers and sellers in the warm air heating, sheet metal contracting and air conditioning industry.

FOR SALE

SHEET METAL CUTTING TOOL

PAT. APPLIED
FOR



A simple to operate, clean cutting tool that should be in every sheet metal shop.

Inexpensive, it is a real time and money saver. Priced at \$2.50, cash with order delivers it anywhere in the U. S. Hand made and guaranteed.

RALPH W. POE • CANTON, ILL.
Dept. A

Air Filtering Unit Patent

A cleanable, self-contained unit, designed to last indefinitely. Wish to contact firm mechanically equipped and financially backed that can put this product on the market on its Air Filtering Mechanical Merits. Address Key 388, "American Artisan," 6 N. Michigan Ave., Chicago.

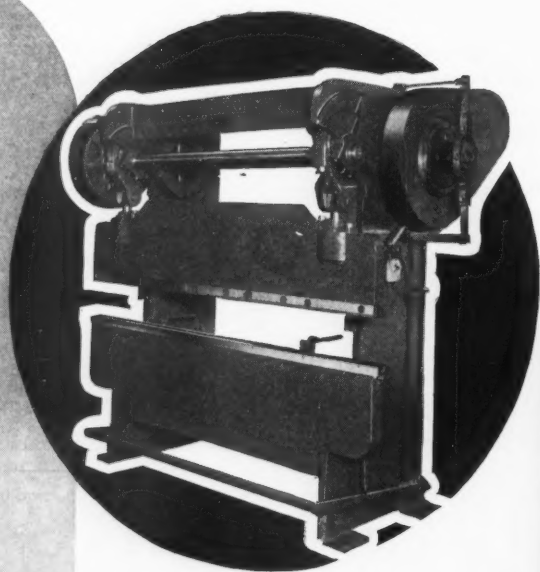


Thrills of Advancement Are Within Your Reach!

Sheet Metal Men to be Successful must fully understand Pattern Drafting, Plan Reading, Estimating, Designing, Calculations, Air Conditioning, etc. Your spare time at Home will achieve wonders for next Spring and Summer. Come! Study for Advancement Now. Our Courses are specially prepared for Home Study.

Full information is free—no obligation—select your Course, and write today.
☐ S-M Design and Pattern Drafting.
☐ Forced W-A Heating and Air Conditioning.
☐ Mechanical Air Conditioning, Refrigeration.
☐ Heating-Ventilating Engineering.
☐ Estimating and Other Courses.

ST. LOUIS TECHNICAL INSTITUTE
O. W. Kothe, Dir.
4541 Clayton Ave. St. Louis, Mo.



Verson

JUNIOR PRESS BRAKES

—Built in 6 sizes—

A new line developed especially for the Sheet Metal industry. Fast, powerful, economical units, light enough to be moved to the job, heavy enough to insure sharp, straight bends the full length of the bed. Ideal for bending, forming, notching, piercing or any Press Brake operation ordinarily done on larger, more costly machines.

Descriptive bulletin sent on request. Also literature describing larger types of Press Brakes and Power Presses.

DIES: All types of dies furnished. Write for 48 page Die Catalog No. BD-36.

ALLSTEEL PRESS CO.

12019 SO. PEORIA ST., CHICAGO



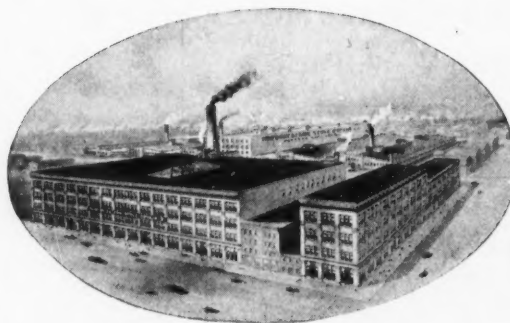
NORTHWESTERN BIDS FOR YOUR REPAIR BUSINESS!

TRY Northwestern first! Practically any part for any repair job may be secured from our tremendous stock. Just think . . . over 60,000 bins that contain over 300,000 parts should be ample assurance that whatever you need can be shipped quickly and efficiently. As suppliers of repair parts to fit Furnaces, Stoves, Ranges and Boilers, Northwestern has led the field since 1869 . . . 67 years of service that we are proud of and that have placed us in the position of being the largest repair supply organization in the country.

The New Repair Parts Price List is ready to be sent you upon request.

NORCO PRODUCTS

- FURNACES
- FURNACE CEMENT
- PIPE AND FITTINGS
- REGISTERS AND GRILLES
- AIR CONDITIONING
- TANK HEATERS, STOVES, ETC.



Send for illustrated order book.

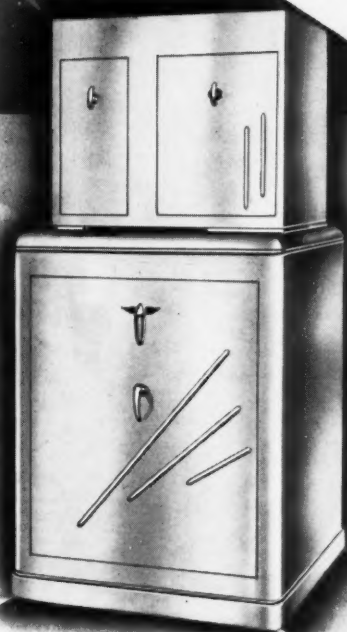
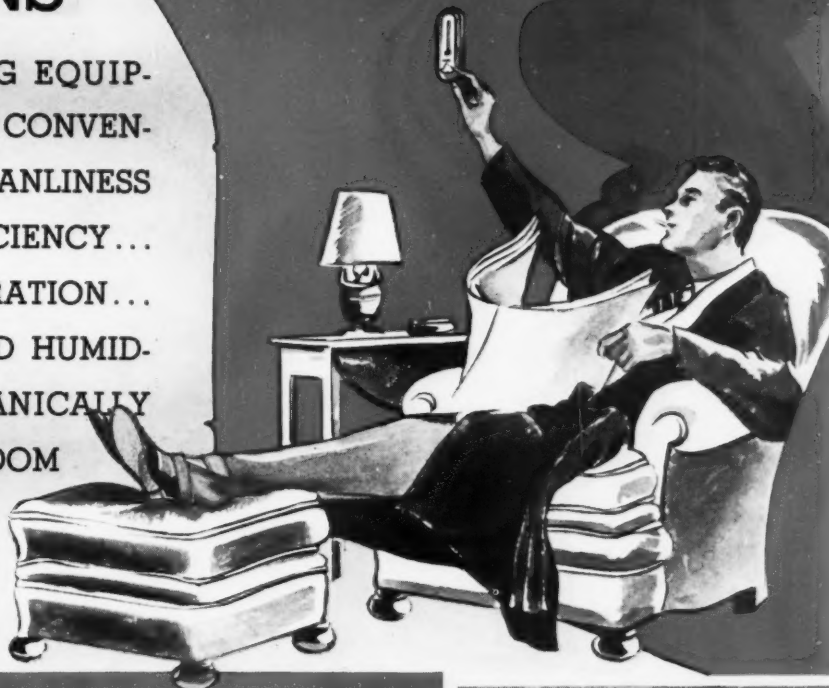
NORTHWESTERN STOVE REPAIR CO.

662 W. Roosevelt Road
Chicago, Illinois

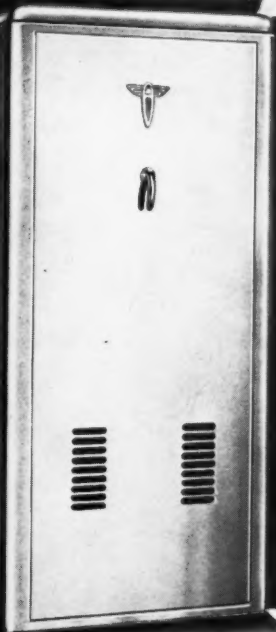
SPECIFICATIONS

JANITROL GAS-HEATING EQUIPMENT for... COMFORT... CONVENIENCE... BEAUTY... CLEANLINESS... COMPACTNESS... EFFICIENCY... ECONOMY... QUIET OPERATION... ACCESSIBILITY... FILTERED HUMIDIFIED WARM AIR MECHANICALLY CIRCULATED IN EVERY ROOM

... UNDER COMPLETE
AUTOMATIC
CONTROL



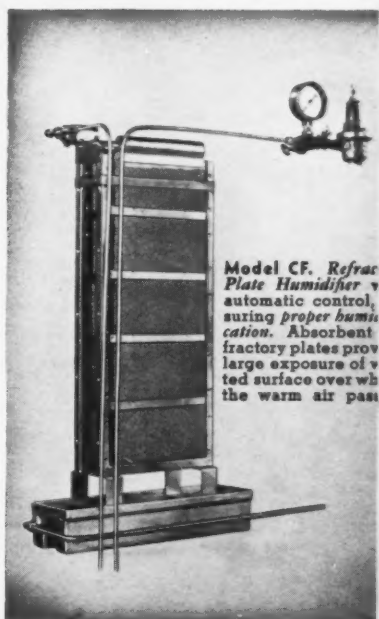
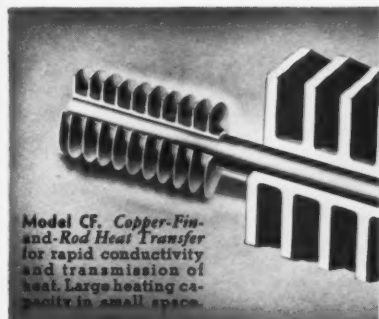
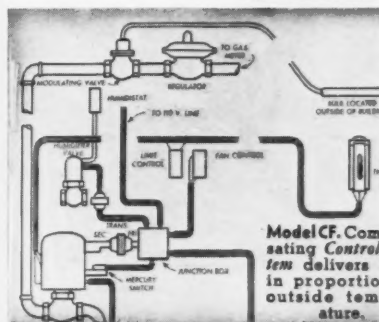
Conditioner Model CF



Conditioner Model CA

SATISFY EVERY CUSTOMER REQUIREMENT *with* JANITROL WINTER AIR CONDITIONERS

The most profitable heating equipment to handle is that which most completely meets *all* the requirements of *all* your customers. Selection is now made easy for you by the outstanding engineering and design achievements so apparent in the new Janitrol WINTER AIR CONDITIONERS. Here is eye-taking beauty and compactness. Inside the handsome cabinets are exclusive superiorities that quickly bring orders for installation. Observe particularly in Model CF (1) the remarkable Copper-Fin-and-Rod Heat Transfer (2) the automatic Refractory Plate Humidifier, and (3) the Compensating System of Control. Make sure your selling efforts are applied to a line that will bring you maximum returns. Send for the free booklet on "Janitrol Products." SURFACE COMBUSTION CORPORATION TOLEDO, OHIO



JANITROL WINTER AIR CONDITIONERS

Thousands of home owners are ready to change to modern automatic **GAS HEAT**

Thousands of store operators want freedom from furnace tending

MAKE THEM YOUR CUSTOMERS
WITH THE SPECIAL FEATURES
OF *Janitrol*

Quiet Janitrol
ti-Inspirator Burner

Streamlined Heat
Distributor inside
the cabinet top

Efficient Janitrol
Heat Exchanger

GRAVITY HEATERS

BEAUTY—The cabinet of the Janitrol gravity heater is of finest furniture steel, finished in attractive tapestry blue crinkle with modern fixtures of gleaming chromium. Compactness makes possible full use of basement space.

STREAMLINED HEAT DISTRIBUTOR inside the cabinet assures equal distribution of heat to all pipes—eliminates the unsightly bonnet.

HUMIDIFIER—pan-type, placed atop the heat exchanger. Float-tank control.

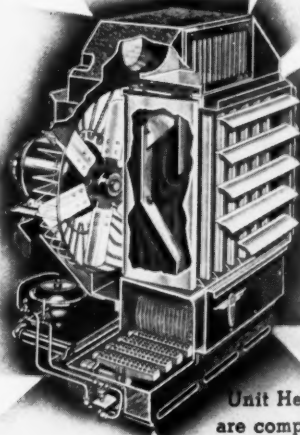
and UNIT HEATERS

TWO principal series of unit heaters in the Janitrol line enable you to meet every requirement of stores, offices and other small commercial establishments—also large offices, stores, warehouses, etc. The customer instantly sees that this modern compact automatic gas-fired equipment frees him of all furnace tending and banishes any difficulties with over-heating, under-heating or spotty heating. Write for this free booklet on "Janitrol Products."

SURFACE COMBUSTION CORPORATION
TOLEDO, OHIO



Unit Heaters have wide
streamlined air-flow contact



Unit Heaters
are complete
automatic



JANITROL

GRAVITY HEATERS UNIT HEATERS

Section of
JANUARY, 1937
AMERICAN ARTISAN

1937
DIRECTORY

OF WARM AIR HEATING, RESIDENTIAL AIR
CONDITIONING AND SHEET METAL PRODUCTS

Section 1.—Products Advertised In This Issue

Section 2.—Products Classified

Section 3.—Trade Names

Section 4.—Manufacturers' Addresses

HOW TO USE THIS DIRECTORY

If you want to know the names of one or more manufacturers making a certain product, look in Section 2, where that product will appear in its proper place in the listing. The products featured and described in advertisements in this issue are separately classified in Section 1, and the numbers of the pages on which they appear are given. If you have the trade name of a product and want to know who manufactures it, look in Section 3, where trade names are alphabetically listed. For the complete name and address of any manufacturer look in Section 4.

● The manufacturers whose names are starred throughout the listing advertise their products in this issue. Turn to Index to Advertisers, page 188, for the page on which you will find the advertising of any of these manufacturers. See also Part I.

Index to Advertisers

Firms represented in this issue are identified by the folio of the page on which their advertising appears.

January, 1937

Acme Heating & Ventilating Co. 153
Acme Electric Welder Co. 180
Aerofin Corp. 144
Air Cond. Equipment Corp. 161
Airecon Industries, Inc. 161
Allsteel Press Co. 184
American Air Filter Co., Inc. 154
American Brass Co. 10
American Fdry. & Furnace Co. 181
A. S. H. & V. E. 148
American Rolling Mill Co., The 31
Auer Register Co. 84
Autocrat Oil Burner Corp. 161
Automatic Humidifier Co. 80
Automatic Products Co. 155
Autovent Fan & Blower Co. 147

Barber-Colman Co. 6 and 159
Barber Gas Burner Co., The 95
Bead Chain Mfg. Co. 34
Benson Co., Inc., Alex R. 181
Berger Bros. Co. 179
Berger Mfg. Co., Div. of Republic Steel Corp. Inside Front Cover
Bethlehem Steel Co. 40
Brauer Supply Co., A. G. 24
Bremil Mfg. Co. 181
Breuer Electric Mfg. Co. 178
Brillion Furnace Co. 168
Buffalo Forge Co. Inside Back Cover
Burnley Battery Co. 180

Canton Steel Ceiling Co. 178
Capitol Furnace & Stove Repair Co. 179
Central Furnace & Stove Repair Co. 177
Century Electric Co. 98
Century Engineering Corp. 82
Champion Tool Co. 178
Chandler Co. 152
Chicago Steel Furnace Co. 161
Christie Cleaner Co. 179
Clarage Fan Co. 132
Congress Tool & Die Co. 159
Cook Electric Co. 85

Dail Steel Products Co. 138
Detroit Lubricator Co. 96 and 97
Dreis & Krump Mfg. Co. 169

Econocool Stoker Co. 160
Electric Vacuum Clnr. Co., Inc. 176
Electrol, Inc. 151
Elgo Shutter & Mfg. Co. 155
Emerson Electric Co. 153

Favorite Stove Co., The 175
Fireline Stove & Furnace Lining Co. 168 and 183
Fitzgibbons Boiler Co., Inc. 88
Forest-Air Co. 161
Forest City Foundries Co., The 22
Fox Furnace Co., The 8 and 9
Friez & Sons, Julien P. 135
Furblo Co. 157

G & O Mfg. Co. 157
General Electric Co. 18 and 19
Gleason-Avery, Inc. 146

Grand Rapids Furnace Cleaner Co. 175
Griswold Mfg. Co. 25

Hall-Neal Furnace Co. 93
Harrington & King Perf. Co. 179
Hart & Cooley Mfg. Co. 28 and 29
Henry Furnace & Foundry Co., The 131
Hess-Snyder Co. 177
Hess Warming & Vtlg. Co. 156
"Home Comfort" Furnace & Mfg. Co. 33
Hussey & Co., C. G. 43

Illinois Testing Lab., Inc. 161
Independent Rgr. & Mfg. Co. 37
International Nickel Co., Inc. 5
Interstate Machinery Co. 183

Joliet Heating Corp. 117, 118 and 119

Kent Co., Inc. 180

Laclede-Christy Clay Products Co. 175
Lamneck Products, Inc. 164
Lau Blower Co. 94
Libert Machine Co. 175
Lochinvar Corp. 163

Maid-O'-Mist, Inc. 89
Maplewood Machinery Co. 183
Marshalltown Mfg. Co. 173
Maurey Mfg. Corp. 140
Mercoid Corp., The 74
Meyer & Bro. Co., F. 11 and 14
Meyer Furnace Co. 12 and 13
Milcor Steel Co. Outside Back Cover
Minneapolis-Honeywell Regulator Co. 78 and 79
Monmouth Products Co. 77
Mt. Vernon Furnace & Mfg. Co. 171
Mueller Furnace Co. 26 and 27

National Fan & Blower Corp. 159
National Fdry. and Furnace Co. 181
Niagara Machine & Tool Works 16
Northwestern Stove Repair Co. 170 and 184
Nu-Way Corp., The 160

Ohio Electric Mfg. Co. 159
Ohio Products Co. 157
Oil Burner Builders, Inc. 158
Osborn Co., J. M. & L. A. 21
Owens-Illinois Glass Co. 75

Pacific Gas Radiator Co. 136
Parker-Kalon Corp. 20
Payne Furnace & Supply Co. 86 and 87
Peck, Stow & Wilcox Co. 167
Peerless Electric Co. 158
Peerless Foundry Co. 38 and 39
Peninsular Stove Co. 169
Penn Electric Switch Co. 90 and 91
Perfex Controls Co. 139

Pick Hotels, Albert. 182
Poe, Ralph W. 183
Practical Instrument Co. 161
Premier Division, Electric Vacuum Cleaner Co., Inc. 176
Premier Furnace Co. 121
Pyrolite Products Co. 172

Randall Graphite Products Corp. 23
Register & Grille Mfg. Co. 151
Republic Steel Corp. 44
Revere Copper & Brass, Inc. 15
Rock Island Register Co. 171
Ruby Chemical Co. 182
Rudy Furnace Co. 149
Russell Electric Co. 3
Rybolt Heater Co., The. 35
Ryerson & Son, Inc., Joseph T. 7

St. Louis Technical Institute. 183
Schaefer Brush Mfg. Co. 183
Schwab Furnace & Mfg. Co. 170
Schwitzer-Cummins Co. 81
Scott-Newcomb, Inc. 157
Skilsaw, Inc. 167
Skuttle Co., J. L. 137
Standard Fdry. & Furnace Co. 182
Stanley Electric Tool Div., Stanley Works, Inc. 36
Superior Sheet Steel Co. 122
Supreme Electric Products Corp. 160
Surface Combustion Corp. 185 and 186
Swartwout Co., The. 173

Tannewitz Works, The. 176
Torrington Mfg. Co. 92
Trane Co., The. 141 and 142
Tuttle & Bailey, Inc. 145
Twentieth Century Heating & Ventilating Co. 181

U. S. Air Conditioning Corp. 145
United States Register Co. 41
Universal Blower Co. 161

Victor Electric Co. 150
Viking Shear Co. 182
Vulcan Arc Welder Mfg. Co. 181

Wagner Electric Co. 143
Walsh Refractories Corp. 177
Ward Machinery Co. 180
Waterloo Register Co., The. 112
Waterman-Waterbury Co., The. 111
Wattenamel Co. 182
Wayne Oil Burner Corp. 76
White Mfg. Co. 83
Whitney Mfg. Co., W. A. 174
Whitney Metal Tool Co. 32
Wickwire Spencer Steel Co. 177
Wise Furnace Co., The. 30
Wiss & Sons Co., J. 42

XXth Century Heating & Ventilating Co. 181

Youngstown Sheet & Tube Co. 17

Section of
American Artisan
**1937 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL
 AIR CONDITIONING AND SHEET METAL PRODUCTS**
[Section 1—Products Advertised In This Section Classified]

AIR CONDITIONING FURNACES

See Furnaces, Air Conditioning

AIR CONDITIONING UNITS

See Units, Air Conditioning, Boiler and Furnace

AIR FILTERS

See Filters, Air

AIR IMPELLERS

See Blades and Wheels, Fan and Blower

ARC WELDERS

See Welders, Arc

ATTIC FANS

See Fans, Attic

BACK-DRAFT DAMPERS

See Shutters and Dampers, Back Draft

BEARINGS

See Blocks, Pillow

BLADES AND WHEELS, FAN AND BLOWER

Clarage Fan Co.	132
Peerless Electric Co.	158
Schwitzer-Cummins Co.	81
Torrington Mfg. Co.	92

BLOCKS, PILLOW

Peerless Electric Co.	158
Randall Graphite Products Corp.	23
Schwitzer-Cummins Co.	81

BLOWER-FILTER UNITS

See Units, Blower-Filter

BLOWER WHEELS

See Blades and Wheels, Fan and Blower

Page

BLOWERS

See Fans and Blowers, Exhaust and Ventilating

BLOWERS, FORCED DRAFT

Autovent Fan & Blower Co.	147
Universal Blower Co.	161

BLOWERS, FURNACE

Air Conditioning Equipment Co.	161
Autovent Fan & Blower Co.	147
Buffalo Forge Co.	Inside Back Cover
Chicago Steel Furnace Co.	161
Clarage Fan Co.	132
Emerson Electric Mfg. Co.	153
Pacific Gas Radiator Co.	136
Peerless Foundry Co.	38, 39

BOILER-BURNER UNITS

See Units, Boiler-Burner

BOOSTER FANS

See Fans, Booster

BRUSHES, FURNACE

Schaefer Brush Mfg. Co.	183
------------------------------	-----

BURNERS, GAS

Barber Gas Burner Co.	95
Surface Combustion Corp.	185, 186

BURNERS, OIL

Autocrat Oil Burner Co.	161
Century Engineering Corp.	82
Electrol, Inc.	151
Hall-Neal Furnace Co.	93
Lochinvar Corp.	163
Nu-Way Corp.	160
Oil Burner Builders, Inc.	158
Scott-Newcomb, Inc.	157
Wayne Oil Burner Corp.	76

CABINETS AND CASINGS

Berger Mfg. Co., Div. Republic Steel Corp. .. Inside Front Cover

CEILINGS, STEEL

Canton Steel Ceiling Co.	178
-------------------------------	-----

CEMENT, FURNACE

	Page
Fireline Stove & Furnace Lining Co.....	183
LaCledé-Christy Clay Products Co.....	175
Pyrolite Products Co.....	172
Walsh Refractories Corp.....	177

CHAIN

Bead Chain Mfg. Co.....	34
Hart & Cooley Mfg. Co.....	28, 29

CLEANERS, VACUUM, FURNACE

Breuer Electric Mfg. Co.....	178
Christie Cleaner Co.....	179
Electric Vacuum Cleaner Co., Inc.....	176
Grand Rapids Furnace Cleaner Co.....	175
Kent Co., Inc.....	180

CLINKER TONGS

See Tongs, Clinker

COILS, COOLING AND HEATING

Aerofin Corp.....	144
G & O Mfg. Co.....	157
Trane Co.....	141, 142

COMPOUNDS, SOLDERING

Benson Co., Inc., Alex. R.....	181
Burnley Battery & Mfg. Co.....	180
Ruby Chemical Co.....	182

CONDENSERS, EVAPORATIVE

Trane Co.....	141, 142
---------------	----------

CONDUCTOR FITTINGS

See Fittings and Accessories, Conductor

CONDUCTOR PIPE

See Pipe, Conductor

CONTROLS

Automatic Products Co.....	155
Barber-Colman Co.....	159
Cook Electric Co.....	85
Detroit Lubricator Co.....	96, 97
Friez & Sons, Inc., Julien P.....	135
Gleason-Avery, Inc.....	146
Joliet Heating Corp.....	119
Mercoild Corp.....	74
Minneapolis-Honeywell Regulator Co.....	78, 79
Monmouth Products Co.....	77
Penn Electric Switch Co.....	90, 91
Perfex Controls Co.....	139
Russell Electric Co.....	3
Supreme Electric Products Corp.....	160
White Mfg. Co.....	83

COOLING COILS

See Coils, Cooling and Heating

COPPER

	Page
American Brass Co.....	10
Hussey & Co., C. G.....	43
Revere Copper & Brass, Inc.....	15

DAMPERS, PIPE

Griswold Mfg. Co.....	25
Hart & Cooley Mfg. Co.....	28, 29

DAMPER REGULATORS

See Quadrants, Damper

DUCTS AND FITTINGS, SHEET METAL

Lamneck Products, Inc.....	164
Meyer & Bro. Co., F.....	11

EAVES TROUGH AND GUTTERS

Berger Brothers Co.....	179
Hussey & Co., C. G.....	43
Milcor Steel Co.....	Outside Back Cover
Osborn Co., J. M. & L. A.....	21

EAVES TROUGH FITTINGS

See Fittings and Accessories, Eaves Trough and Gutters

ELECTRIC MOTORS

See Motors, Electric

EVAPORATIVE CONDENSERS

See Condensers, Evaporative

FAN BLADES

See Blades and Wheels, Fan and Blower

FANS, ATTIC

Autovent Fan & Blower Co.....	147
National Fan & Blower Corp.....	159

FANS, BOOSTER

American Foundry & Furnace Co.....	181
Autovent Fan & Blower Co.....	147
Forst-Air Co.....	161
Universal Blower Co.....	161
Victor Electric Products, Inc.....	150

FANS AND BLOWERS, EXHAUST AND VENTILATING

Autovent Fan & Blower Co.....	147
Buffalo Forge Co.....	Inside Back Cover
Clarage Fan Co.....	132
National Fan & Blower Corp.....	159
Schwitzer-Cummins Co.....	81
Universal Blower Co.....	161

FILTERS, AIR

Page

American Air Filter Co., Inc.....	154
Owens-Illinois Glass Co.	75

FITTINGS AND ACCESSORIES, CONDUCTOR

Berger Brothers Co.	179
Hussey & Co., C. G.	43
Osborn Co., J. M. & L. A.....	21

FITTINGS AND ACCESSORIES, EAVES TROUGH AND GUTTER

Berger Brothers Co.	179
Hussey & Co., C. G.	43
Osborn Co., J. M. & L. A.....	21

FLASHING

Revere Copper & Brass, Inc.	15
----------------------------------	----

FLOOR FURNACES*See Furnaces, Floor***FORCED DRAFT BLOWERS***See Blowers, Forced Draft***FURNACE AIR CONDITIONING UNITS***See Units, Air Conditioning, Furnace***FURNACE BLOWERS***See Blowers, Furnace***FURNACE BRUSHES***See Brushes, Furnace***FURNACE CEMENT***See Cement, Furnace***FURNACE CHAIN***See Chain***FURNACE LININGS***See Refractories***FURNACE PIPE***See Pipe and Fittings, Furnace***FURNACE REPAIRS***See Repairs, Furnace and Stove***FURNACE VACUUM CLEANERS***See Cleaners, Vacuum, Furnace***FURNACES, AIR CONDITIONING**

Page

Century Engineering Corp. (Oil).....	82
Dall Steel Products Co. (Oil).....	138
Electrol, Inc. (Oil).....	151
Forest City Foundries Co. (Coal, Gas, Oil).....	22
Fox Furnace Co. (Coal, Gas, Oil).....	8, 9
Hall-Neal Furnace Co. (Coal, Oil, Stoker).....	93
Henry Furnace & Foundry Co. (Coal, Gas, Oil, Stoker)....	131
Hess Warming & Ventilating Co.	156
"Home Comfort" Furnace & Mfg. Co. (Coal, Gas, Oil)....	33
Joliet Heating Corp. (Coal, Gas, Oil, Stoker).....	117, 118, 119
Lochinvar Corp. (Oil)	163
Meyer Furnace Co. (Coal, Gas, Oil).....	12, 13
Mueller Furnace Co., L. J. (Coal, Gas, Oil).....	26, 27
Nu-Way Corp. (Oil)	160
Oil Burner Builders, Inc. (Oil).....	158
Osborn Co., J. M. & L. A.	21
Pacific Gas Radiator Co. (Gas).....	136
Payne Furnace & Supply Co. (Gas).....	86, 87
Peerless Foundry Co.	38, 39
Premier Furnace Co. (Coal, Gas, Oil, Stoker).....	121
Rudy Furnace Co. (Coal, Gas, Oil).....	149
Rybolt Heater Co.	35
Schwab Furnace & Mfg. Co.	170
Scott-Newcomb, Inc. (Oil)	157
Trane Co. (Oil)	141, 142
Surface Combustion Corp. (Gas).....	185, 186
Waterman-Waterbury Co. (Oil)	111
Wayne Oil Burner Corp. (Oil).....	76

FURNACES, FLOOR

Pacific Gas Radiator Co.....	136
Payne Furnace & Supply Co.....	86, 87

FURNACES, WARM AIR, GRAVITY

Brillion Furnace Co.	163
Favorite Mfg. Co.	175
Forest City Foundries Co. (Coal, Gas, Oil).....	22
Fox Furnace Co. (Coal and Gas).....	8, 9
Hall-Neal Furnace Co.	93
Henry Furnace & Foundry Co. (Coal, Gas).....	131
Hess-Snyder Co.	177
Hess Warming & Ventilating Co.....	156
"Home Comfort" Furnace & Mfg. Co.....	33
Joliet Heating Corp. (Gas, Oil).....	117, 118, 119
Lochinvar Corp. (Oil)	163
Meyer Furnace Co. (Coal, Gas, Wood).....	12, 13
Mt. Vernon Furnace & Mfg. Co.....	171
Mueller Furnace Co., L. J. (Oil).....	26, 27
Osborn Co., J. M. & L. A.....	21
Pacific Gas Radiator Co. (Gas).....	136
Payne Furnace & Supply Co. (Gas).....	86, 87
Peerless Foundry Co.	38, 39
Premier Furnace Co. (Coal and Stoker).....	121
Rybolt Heater Co.	35
Schwab Furnace & Mfg. Co.	170
Standard Foundry & Furnace Co.....	182
Waterman-Waterbury Co.	111
Wise Furnace Co.	30
XXth Century Heating & Ventilating Co.....	181
Surface Combustion Corp. (Gas).....	185, 186

GAS BURNERS*See Burners, Gas***GAS PRESSURE REGULATORS***See Regulators, Pressure, Gas***GAS UNIT HEATERS***See Heaters, Unit, Gas-Fired***GRILLES***See Registers and Grilles***GUTTERS***See Eaves Trough and Gutters***HEATERS, HORIZONTAL**

Acme Heating & Ventilating Co. 153

HEATERS, ROOM

Meyer Furnace Co. 12, 13
 Mueller Furnace Co., L. J. 26, 27
 Payne Furnace & Supply Co. 86, 87
 Surface Combustion Corp. 185, 186

HEATERS, UNIT, GAS-FIRED

Pacific Gas Radiator Co. 136
 Surface Combustion Corp. 185, 186

HEATERS, WATER

Century Engineering Corp. 82
 Lochinvar Corp. 163
 Pacific Gas Radiator Co. 136
 Scott-Newcomb, Inc. 157

HEATING COILS*See Coils, Cooling and Heating***HUMIDIFIER VALVES***See Valves, Humidifier***HUMIDIFIERS**

Automatic Humidifier Co. 80
 Century Engineering Corp. 82
 Chandler Co. 152
 Maid-O'-Mist, Inc. 89
 Monmouth Products Co. 77
 Skuttle Co., J. L. 137
 Supreme Electric Products Corp. 160
 Trane Co. 141, 142
 Universal Blower Co. 161

INSTRUMENTS, INDICATING, RECORDING, TESTING

Friez & Sons, Inc., Julien P. 135
 Illinois Testing Laboratories, Inc. 161
 Practical Instrument Co. 161

Page

JACKETS*See Cabinets and Casings*

Page

MACHINERY, SHEET METAL

Maplewood Machinery Co., Inc. 183
 Ward Machinery Co. 180

METALS, PERFORATED

Harrington & King Perforating Co. 179
 Wickwire Spencer Steel Co. 177

MONEL

International Nickel Co., Inc. 5

MOTORS, ELECTRIC

Century Electric Co. 98
 Ohio Electric Mfg. Co. 159
 Peerless Electric Co. 158
 Wagner Electric Corp. 143

NAILS, COPPER

Hussey & Co., C. G. 43

OIL BURNERS*See Burners, Oil***PAINT, CRACKLE FINISH**

Wattenamel Co. 182

PERFORATED METALS*See Metals, Perforated***PILLOW BLOCKS***See Blocks, Pillow***PIPE, CONDUCTOR**

Hussey & Co., C. G. 43
 Osborn Co., J. M. & L. A. 21

PIPE AND FITTINGS, FURNACE

Meyer & Bro., Co., F. 11

PULLEYS, FAN AND MOTOR

Congress Tool & Die Co. 159
 Maurey Mfg. Corp. 140
 Peerless Electric Co. 158

PUMPS

Trane Co. 141, 142

RADIATOR SHIELDS*See Shields, Radiator***RECORDING INSTRUMENTS***See Instruments, Indicating, Recording, Testing***QUADRANTS, DAMPER**

Hart & Cooley Mfg. Co.	28, 29
Ohio Products Co.	157
Parker-Kalon Corp.	20

REFRACTORIES

Fireline Stove & Furnace Lining Co.	168
Walsh Refractories Corp.	177

REGISTERS AND GRILLES

Auer Register Co.	84
Barber-Colman Co.	6
Hart & Cooley Mfg. Co.	28, 29
Independent Register Co.	37
Register & Grille Mfg. Co.	151
Rock Island Register Co.	171
Tuttle & Bailey, Inc.	145
United States Register Co.	41
Waterloo Register Co.	112

REGULATORS, PRESSURE, GAS

Barber Gas Burner Co.	95
----------------------------	----

REPAIRS, FURNACE AND STOVE

Brauer Supply Co., A. G.	24
Capitol Furnace & Stove Repair Co.	179
Central Furnace & Stove Repair Co.	177
Favorite Stove Co.	175
Hess-Snyder Co.	177
National Foundry & Furnace Co.	181
Northwestern Stove Repair Co.	184
Peninsular Stove Co.	169
Standard Foundry & Furnace Co.	182

RIDGE ROLLS AND RIDGING

Hussey & Co., C. G.	43
--------------------------	----

RIVETS, COPPER

Hussey & Co., C. G.	43
--------------------------	----

ROOF VENTILATORS*See Ventilators, Roof***ROOFING, COPPER**

American Brass Co.	10
Hussey & Co., C. G.	43
Revere Copper & Brass, Inc.	15

ROOM HEATERS*See Heaters, Room***SHAPES, STRUCTURAL**

Ryerson & Son, Inc., Joseph T.	7
Youngstown Sheet & Tube Co.	17

Page

SHEET METAL PIPE AND FITTINGS*See Ducts and Fittings, Sheet Metal*

Page

SHEET METAL WORKING TOOLS*See Tools, Sheet Metal Working***SHEETS**

American Brass Co.	10
American Rolling Mill Co.	31
Bethlehem Steel Co.	40
Hussey & Co., C. G.	43
International Nickel Co., Inc.	5
Osborn Co., J. M. & L. A.	21
Republic Steel Corp.	44
Revere Copper & Brass, Inc.	15
Ryerson & Son, Inc., Joseph T.	7
Superior Sheet Steel Co.	122
Youngstown Sheet & Tube Co.	17

SHIELDS, RADIATOR

Meyer & Bro. Co., F.	14
---------------------------	----

SHUTTERS AND DAMPERS, BACK DRAFT

Airecon Industries, Inc.	161
Elgo Shutter & Mfg. Co.	156
Universal Blower Co.	161

SOLDERING FLUX, PASTES AND SALTS*See Compounds, Soldering***SPOT WELDERS***See Welders, Spot***STEEL CEILINGS***See Ceilings, Steel***STOKERS**

Econocol Stoker Div., Cotta Transmission Corp.	160
Hall-Neal Furnace Co.	93
Schwab Furnace & Mfg. Co.	170
Scott-Newcomb, Inc.	157

STOVE REPAIRS*See Repairs, Boiler, Furnace and Stove***STRUCTURAL SHAPES***See Shapes, Structural***SWITCHES, TIME**

Gleason-Avery, Inc. 146

TESTING INSTRUMENTS*See Instruments, Indicating, Recording, Testing***TIME SWITCHES***See Switches, Time***TONGS, CLINKER**

Northwestern Stove Repair Co. 170

TOOLS, SHEET METAL WORKING

Allsteel Press Co., Inc.	184
Bremil Mfg. Co.	181
Champion Tool Co.	178
Dreis & Krump Mfg. Co.	169
Hussey & Co., C. G.	43
Libert Machine Co.	175
Marshalltown Mfg. Co.	173
Niagara Machine & Tool Wks.	16
Osborn Co., J. M. & L. A.	21
Peck, Stow & Wilcox Co.	167
Poe, Ralph W.	183
Skilsaw, Inc.	167
Stanley Electric Tool Div., The Stanley Wks.	36
Tannewitz Wks.	176
Viking Shear Co.	182
Ward Machinery Co.	180
Whitney Metal Tool Co.	32
Whitney Mfg. Co., W. A.	174
Wiss & Sons Co., J.	42

UNITS, AIR CONDITIONING, BOILER

Electrol, Inc.	151
Fitzgibbons Boiler Co., Inc.	88
Mueller Furnace Co., L. J.	26, 27
Scott-Newcomb, Inc.	157
Trane Co.	141, 142

UNITS, AIR CONDITIONING, FURNACE

Electrol, Inc.	151
Furblo Co.	157
Mueller Furnace Co., L. J.	26, 27
National Fan & Blower Corp.	159
Russell Electric Co.	3
Scott-Newcomb, Inc.	157
Trane Co.	141, 142
U. S. Air Conditioning Corp.	145

Page

UNITS, BLOWER—FILTER

Page

Air Conditioning Equipment Co.	161
Furblo Co.	157
Hall-Neal Furnace Co.	93
Henry Furnace & Foundry Co.	131
Hess Warming & Ventilating Co.	156
"Home Comfort" Furnace & Mfg. Co.	33
Lau Blower Co.	94
Meyer Furnace Co.	12, 13
Mueller Furnace Co., L. J.	26, 27
Osborn Co., J. M. & L. A.	21
Payne Furnace & Supply Co.	86, 87
Peerless Foundry Co.	38, 39
Premier Furnace Co.	121
Schwab Furnace & Mfg. Co.	170
Schwitzer-Cummins Co.	81
U. S. Air Conditioning Corp.	145

UNITS, BOILER—BURNER

Century Engineering Corp.	82
Fitzgibbons Boiler Co., Inc.	88
Scott-Newcomb, Inc.	157
Wayne Oil Burner Corp.	76

VALVES, HUMIDIFIER, WATER LEVEL

Automatic Humidifier Co.	80
Chandler Co.	152
Maid-O'-Mist, Inc.	89
Monmouth Products Co.	77
Skuttle Co., J. L.	137
Supreme Electric Products Corp.	160
Universal Blower Co.	161

VENTILATORS, ROOF

Berger Brothers Co.	179
Meyer & Bro. Co., F.	14
Swartwout Co.	173

WARM AIR FURNACES*See Furnaces, Warm Air, Gravity***WATER HEATERS***See Heaters, Water***WELDERS, ARC**

General Electric Co.	18, 19
Vulcan Arc Welder Mfg. Co.	181

WELDERS, SPOT

Acme Electric Welder Co.	180
Interstate Machinery Co., Inc.	183

Section of
American Artisan
**1937 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL
AIR CONDITIONING AND SHEET METAL PRODUCTS**

[[Section 2—PRODUCTS CLASSIFIED]]

**AIR CONDITIONING UNITS, CENTRAL SYSTEM,
BOILER TYPE**

(Self-contained fan-filter-humidifier-heat transfer surface unit for connection to steam or hot water, refrigeration)

- Airtemp, Inc., Dayton, Ohio.
- American Blower Corp., Detroit, Mich.
- American Radiator Co., New York City
- Ames Co., W. R., San Francisco, Cal.
- Autovent Fan & Blower Co., Chicago, Ill.
- Baker Ice Machine Co., Inc., Omaha, Nebr.
- Betz Unit Air Cooler Co., Kansas City, Mo.
- Bishop & Babcock Sales Co., Cleveland, O.
- Bryan Steam Corp., Peru, Ind.
- Bryant Heater Co., Cleveland, O.
- Buffalo Forge Co., Buffalo, N. Y.
- Carbondale Machine Corp., Harrison, N. J.
- Carraway-Byrd Corp., Dallas, Tex.
- Carrier Corp., Newark, N. J.
- Century Engineering Corp., Cedar Rapids, Ia.
- Clarage Fan Co., Kalamazoo, Mich.
- Delco-Frigidaire Conditioning Div., General Motors Sales Corp., Dayton, O.
- Easternoll, Inc., Portland, Me.
- Electrol, Inc., Clifton, N. J.
- Fitzgibbons Boiler Co., Inc., New York, N. Y.
- General Electric Co., Schenectady, N. Y.
- General Refrigeration Sales Co., Beloit, Wis.
- Harvey-Whipple, Inc., Springfield, Mass.
- Hell Co., Milwaukee, Wis.
- Howes Co., S. M., Boston, Mass.
- Hubbard Co., Minneapolis, Minn.
- Hugo Mfg. Co., West Duluth, Minn.
- Johnson Co., S. T., Oakland, Cal. and Philadelphia, Pa.
- Joliet Heating Corp., Joliet, Ill.
- Kelvinator Corp., Detroit, Mich.
- Kewanee Boiler Corp., Kewanee, Ill.
- Lewis Air Conditioners, Inc., Minneapolis, Minn.
- May Oil Burner Corp., Baltimore, Md.
- McCormick & Co., J. H., Williamsport, Pa.
- McQuay, Inc., Minneapolis, Minn.
- Mellish & Murray Co., Chicago, Ill.
- Merrill Co., Inc., Boston, Mass.
- Modine Mfg. Co., Racine, Wis.
- Nash Refrigeration Co., Inc., Newark, N. J.
- National Fan & Blower Corp., Chicago, Ill.
- Nelson Co., Detroit, Mich.
- Nelson Corp., Herman, Moline, Ill.
- Niagara Blower Co., New York City.
- Norge Heating & Conditioning Division of Borg-Warner Corp., Detroit, Mich.
- Reif-Rexoll, Inc., Buffalo, N. Y.
- Robeson Engineering Co., East Orange, N. J.
- Russell Electric Co., Chicago, Ill.
- Savage Arms Corp., New York City.
- Scott-Newcomb, Inc., St. Louis, Mo.
- Stilphen Engineering & Mfg. Co., C. A., Denver, Colo.
- Syncro-Flame Burner Corp., Hartford, Conn.
- Syncromatic Air Conditioning Corp., Milwaukee, Wis.
- Thermal Units Mfg. Co., Chicago, Ill.
- Trane Co., La Crosse, Wis.
- Unified Air Conditioner Co., Duluth, Minn.
- United States Radiator Corp., Detroit, Mich.
- Waterfilm Boilers, Inc., Jersey City, N. J.
- Wayne Oil Burner Corp., Ft. Wayne, Ind.
- Williams Oil-O-Matic Heating Corp., Bloomington, Ill.
- Wood Industries, Inc., Gar, Detroit, Mich.
- York Ice Machinery Corp., York, Pa.
- Young Radiator Co., Racine, Wis.
- American Blower Corp., Detroit, Mich.
- American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace Co., St. Louis, Mo.
- American Machine Products Co., Marshalltown, Ia.
- Ames Co., W. R., San Francisco, Cal.
- Anchor Post Fence Co., Baltimore, Md.
- Arcofeld Mfg. Co., Inc., Seattle, Wash.
- Arex Co., Chicago, Ill.
- Armstrong Furnace Co., Columbus, O.
- Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.
- Auburn Burner Corp., Auburn, Ind.
- Autovent Fan & Blower Co., Chicago, Ill.
- Beck Engineering Combustion Kompany, St. Louis, Mo.
- Bergstrom Mfg. Corp., Neenah, Wis.
- Bishop & Babcock Sales Co., Cleveland, O.
- Brown Sheet Iron & Steel Co., St. Paul, Minn.
- Brundage Co., Kalamazoo, Mich.
- Bryan Plumbing & Heating Co., Bryan, O.
- Bryant Heater Co., Cleveland, O.
- Campbell Heating Co., Des Moines, Ia.
- Campbell Heating Co., E. K., Kansas City, Mo.
- Carrier Corp., Newark, N. J.
- Chandler Co., Cedar Rapids, Ia.
- Chicago Steel Furnace Co., Chicago, Ill.
- Columbus Heating & Ventilating Co., Columbus, O.
- Dall Steel Products Co., Lansing, Mich.
- Delco-Frigidaire Conditioning Div., General Motors Sales Corp., Dayton, O.
- Des Moines Steel Furnace Co., Des Moines, Iowa.
- Dowagiac Steel Furnace Co., Dowagiac, Mich.
- Economy Baler Co., Ann Arbor, Mich.
- Electrol, Inc., Clifton, N. J.
- Evans Corp., George, Moline, Ill.
- Farris Furnace Co., Springfield, Ill.
- Farquhar Furnace Co., Wilmington, O.
- Favorite Mfg. Co., Piqua, O.
- Floral City Co., Monroe, Mich.
- Forest City Foundries Co., Cleveland, O.
- Fox Furnace Co., Elyria, O.
- French Rotary Oil Burner Co., Sebastopol, Cal.
- Furblo Co., Hermansville, Mich.
- Gehri Co., Tacoma, Wash.
- Gilbert & Barker Mfg. Co., Springfield, Mass.
- Green Foundry & Furnace Works, Des Moines, Ia.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Harvey-Whipple, Inc., Springfield, Mass.
- Hart & Crouse Co., Inc., Utica, N. Y.
- Health Air Systems, Inc., Detroit, Mich.
- Hell Co., Milwaukee, Wis.
- Henry Furnace & Foundry Co., Cleveland, O.
- Hess Warming & Ventilating Co., Chicago, Ill.
- Holland Furnace Co., Holland, Mich.
- Home Furnace Co., Holland, Mich.
- Hotentot Co., Inc., Omaha, Nebr.
- Howes Co., S. M., Charlestown, Boston, Mass.
- Hubbard Co., Minneapolis, Minn.
- Ideal Furnace Co., Detroit, Mich.
- International Engineering, Inc., Dayton, O.
- International Heater Co., Utica, N. Y.
- Jaden Mfg. Co., Inc., F. Hastings, Nebr.
- Joliet Heating Corp., Joliet, Ill.
- Keith Furnace Co., Des Moines, Ia.
- Lau Blower Co., Dayton, O.
- Leeson Co., T. F., Detroit, Mich.
- Lennox Furnace Co., Marshalltown, Ia.
- MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
- May Oil Burner Corp., Baltimore, Md.
- Marshall Furnace Co., Marshall, Mich.
- McPherson Furnace & Supply Co., Portland, Ore.
- Mellish & Murray Co., Chicago, Ill.
- Meyer Furnace Co., Peoria, Ill.
- Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- National Fan & Blower Corp., Chicago, Ill.
- Nelson Co., Detroit, Mich.
- Nelson Corp., Herman, Moline, Ill.
- Norge Heating & Conditioning Div. of Borg-Warner Corp., Detroit, Mich.
- Oil Burner Builders, Inc., Bellevue, Iowa.
- Pacific Gas Radiator Co., Los Angeles, Cal.

**AIR CONDITIONING UNITS, CENTRAL SYSTEM,
FURNACE TYPE**

(Self-contained fan-filter-washer or humidifier unit for warm air furnaces)

Airtemp, Inc., Dayton, O.

•Advertisement in this issue. See Index to Advertisers, page 188, and Part 1

- Peerless Foundry Co., Indianapolis, Ind.
- Pennsylvania Furnace & Iron Co., Warren, Pa.
- Premier Furnace Co., Dowagiac, Mich.
- Reif-Rexoil, Inc., Buffalo, N. Y.
- Reynolds Corp., New York, N. Y.
- Robeson Engineering Co., East Orange, N. J.
- Robinson Furnace Co., Chicago, Ill.
- Rock Island Stove Co., Rock Island, Ill.
- Round Oak Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- Russell Electric Co., Chicago, Ill.
- Schwitzer-Cummins Co., Indianapolis, Ind.
- Scott-Newcomb, Inc., St. Louis, Mo.
- Somers, Inc., H. J., Detroit, Mich.
- Sundstrand Sales Co., Rockford, Ill.
- Surface Combustion Corp., Toledo, O.
- Swift Corp., Carl E., Holland, Mich.
- Synco-Flame Burner Corp., Hartford, Conn.
- Syncromatic Air Conditioning Corp., Milwaukee, Wis.
- Texo Sales & Mfg. Co., Cincinnati, O.
- Thatcher Co., Newark, N. J.
- Timken Silent Automatic Div., The Timken-Detroit Axle Co., Detroit, Mich.
- Trane Co., La Crosse, Wis.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- Unified Air Conditioner Co., Duluth, Minn.
- U. S. Air Conditioning Corp., Minneapolis, Minn.
- U. S. Pressed Steel Products Co., Kalamazoo, Mich.
- Viking Air Conditioning Corp., Cleveland, O.
- Waterman-Waterbury Co., Minneapolis, Minn.
- Wayne Oil Burner Corp., Fort Wayne, Ind.
- Western Blower Co., Seattle, Wash.
- Wise Furnace Co., Akron, O.
- XXth Century Heating & Ventilating Co., Akron, O.
- York Oil Burner Co., Inc., York, Pa.

AIR CONDITIONING UNITS, ROOM TYPE, SUMMER

(Cabinet or suspended for cooling, circulating and cleaning)

- Air Devices Corp., Chicago, Ill.
- Alrecon Industries, Detroit, Mich.
- Airtemp, Inc., Dayton, O.
- American Blower Corp., Detroit, Mich.
- Baker Ice Machine Co., Inc., Omaha, Nebr.
- Barrett Engineers, Cleveland Heights, O.
- Betz Unit Air Cooler Co., Kansas City, Mo.
- Buffalo Forge Co., Buffalo, N. Y.
- Campbell Heating Co., E. K., Kansas City, Mo.
- Carbondale Machine Corp., Harrison, N. J.
- Carraway-Byrd Corp., Dallas, Tex.
- Carrier Corp., Newark, N. J.
- Clarage Fan Co., Kalamazoo, Mich.
- Copeland Refrigeration Corp., Detroit, Mich.
- Corozone Air Conditioning Corp., Cleveland, O.
- Curtis Refrigerating Machine Co., St. Louis, Mo.
- De La Vergne Engine Co., Philadelphia, Pa.
- Delco-Frigidaire Conditioning Div., General Motors Sales Corp., Dayton, O.
- Electrogas Furnace & Mfg. Co., San Francisco, Cal.
- Electrol, Inc., Clifton, N. J.
- Electrovent Fan & Mfg. Co., Chicago, Ill.
- Fairbanks, Morse & Co., Chicago, Ill.
- Fedders Mfg. Co., Buffalo, N. Y.
- General Air Conditioning Corp., Cincinnati, O.
- General Electric Co., Schenectady, N. Y.
- General Refrigeration Sales Co., Beloit, Wis.
- Grinnell Co., Inc., Providence, R. I.
- Hardy Mfg. Co., Dayton, O.
- Humidi-Cooler Corp., New Haven, Conn.
- Ilg Electric Ventilating Co., Chicago, Ill.
- Jaden Mfg. Co., Inc., F., Hastings, Nebr.
- Kauffman Air Conditioning Corp., St. Louis, Mo.
- Kelvinator Corp., Detroit, Mich.
- King Ventilating Co., Owatonna, Minn.
- Kool-Kleen Air Conditioner Co., Sioux City, Ia.
- Lewis Air Conditioners, Inc., Minneapolis, Minn.
- McCormick & Co., J. H., Williamsport, Pa.
- McQuay, Inc., Minneapolis, Minn.
- Marlo Coll Co., St. Louis, Mo.
- Meier Electric & Machine Co., Indianapolis, Ind.
- Nash Refrigeration Co., Inc., Newark, N. J.
- National Fan & Blower Corp., Chicago, Ill.
- Nelson Corp., Herman, Moline, Ill.
- Niagara Blower Co., New York City.
- Nomis Corp., Lafayette, Ind.
- Norge Heating & Conditioning Div. of Borg-Warner Corp., Detroit, Mich.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- "Pamco" Conditionaire Co., Chicago, Ill. (Cabinet)
- Peerless Ice Machine Co., Chicago, Ill.
- Rempe Coll Co., Chicago, Ill.
- Savage Arms Corp., New York City.
- Serval, Inc., Evansville, Ind.
- Somers, Inc., H. J., Detroit, Mich.
- Standard Air Conditioning, Inc., New York City.
- Syncromatic Air Conditioning Corp., Milwaukee, Wis.
- Texo Sales & Mfg. Co., Cincinnati, O.
- Thermal Units Mfg. Co., Chicago, Ill.
- Trane Co., La Crosse, Wis.
- Unified Air Conditioner Co., Duluth, Minn.
- Von Seebeck, G., New York City.

- Westinghouse Electric & Mfg. Co., Mansfield, O.
- XL Refrigerating Co., Inc., Chicago, Ill.
- York Ice Machinery Corp., York, Pa.
- Young Radiator Co., Racine, Wis.

AIR CONDITIONING UNITS, ROOM TYPE, WINTER

(Cabinet or suspended for heating, humidifying, circulating and cleaning)

- Alrecon Industries, Detroit, Mich.
- Airtemp, Inc., Dayton, O.
- American Blower Corp., Detroit, Mich.
- Barrett Engineers, Cleveland Heights, O.
- Betz Unit Air Cooler Co., Kansas City, Mo.
- Buffalo Forge Co., Buffalo, N. Y.
- Burnham Boiler Corp., Irvington, N. Y.
- Campbell Heating Co., E. K., Kansas City, Mo.
- Carraway-Byrd Corp., Dallas, Tex.
- Carrier Corp., Newark, N. J.
- Clarage Fan Co., Kalamazoo, Mich.
- Corozone Air Conditioning Corp., Cleveland, O.
- Delco-Frigidaire Conditioning Div., General Motors Sales Corp., Dayton, O.
- Des Moines Steel Furnace Co., Des Moines, Iowa.
- Electrogas Furnace & Mfg. Co., San Francisco, Cal.
- Electrol, Inc., Clifton, N. J.
- Fairbanks, Morse & Co., Chicago, Ill.
- Fedders Mfg. Co., Buffalo, N. Y.
- General Electric Co., Schenectady, N. Y.
- Grinnell Co., Inc., Providence, R. I.
- Health Air Systems, Inc., Detroit, Mich.
- Hugo Mfg. Co., W. Duluth, Minn.
- Ilg Electric Ventilating Co., Chicago, Ill.
- Kauffman Air Conditioning Corp., St. Louis, Mo.
- Lewis Air Conditioners, Inc., Minneapolis, Minn.
- McQuay, Inc., Minneapolis, Minn.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- National Fan & Blower Corp., Chicago, Ill.
- Nelson Corp., Herman, Moline, Ill.
- Niagara Blower Co., New York City.
- Norge Heating & Conditioning Div. of Borg-Warner Corp., Detroit, Mich.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Reif-Rexoil, Inc., Buffalo, N. Y.
- Reznor Mfg. Co., Mercer, Pa.
- Savage Arms Corp., New York City.
- Somers, Inc., H. J., Detroit, Mich.
- Standard Air Conditioning, Inc., New York City.
- Summerheat Co., South Bend, Ind. (Cabinet)
- Surface Combustion Corp., Toledo, O.
- Syncromatic Air Conditioning Corp., Milwaukee, Wis.
- Texo Sales & Mfg. Co., Cincinnati, O.
- Thermal Units Mfg. Co., Chicago, Ill.
- Trane Co., La Crosse, Wis.
- Unified Air Conditioner Co., Duluth, Minn.
- Vigor-Aire Corp., Philadelphia, Pa.
- Westinghouse Electric & Mfg. Co., Mansfield, O.
- Young Radiator Co., Racine, Wis.

AIR CONDITIONING UNITS, ROOM TYPE, YEAR AROUND

(Cabinet or suspended for heating, cooling, humidifying, dehumidifying, circulating and cleaning)

- Alrecon Industries, Detroit, Mich.
- Airtemp, Inc., Dayton, O.
- American Blower Corp., Detroit, Mich.
- Baker Ice Machine Co., Inc., Omaha, Nebr.
- Barrett Engineers, Cleveland Heights, O.
- Betz Unit Air Cooler Co., Kansas City, Mo.
- Buffalo Forge Co., Buffalo, N. Y.
- Carraway-Byrd Corp., Dallas, Tex.
- Carrier Corp., Newark, N. J.
- Clarage Fan Co., Kalamazoo, Mich.
- Corozone Air Conditioning Corp., Cleveland, O.
- De La Vergne Engine Co., Philadelphia, Pa.
- Delco-Frigidaire Conditioning Div., General Motors Sales Corp., Dayton, O.
- Electrogas Furnace & Mfg. Co., San Francisco, Cal.
- Fairbanks, Morse & Co., Chicago, Ill.
- Fedders Mfg. Co., Buffalo, N. Y.
- General Electric Co., Schenectady, N. Y.
- Grinnell Co., Inc., Providence, R. I.
- Handelan Washed Air Co., Minneapolis, Minn.
- Ilg Electric Ventilating Co., Chicago, Ill.
- Kauffman Air Conditioning Corp., St. Louis, Mo.
- Kelvinator Corp., Detroit, Mich.
- Lewis Air Conditioners, Inc., Minneapolis, Minn.
- McCormick & Co., J. H., Williamsport, Pa.
- McQuay, Inc., Minneapolis, Minn.
- Meier Electric & Machine Co., Indianapolis, Ind.
- Miller Conditionair, Inc., Los Angeles, Cal.
- Nash Refrigeration Co., Inc., Newark, N. J.
- National Fan & Blower Corp., Chicago, Ill.
- Niagara Blower Co., New York City.
- Norge Heating & Conditioning Div. of Borg-Warner Corp., Detroit, Mich.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Peerless Ice Machine Co., Chicago, Ill.

Savage Arms Corp., New York City.
 Servel, Inc., Evansville, Ind.
 Standard Air Conditioning, Inc., New York City.
 Syncromatic Air Conditioning Corp., Milwaukee, Wis.
 Texo Sales & Mfg. Co., Cincinnati, O.
 Thermal Units Mfg. Co., Chicago, Ill.
 • Trane Co., La Crosse, Wis.
 Unified Air Conditioner Co., Duluth, Minn.
 Westinghouse Electric & Mfg. Co., Mansfield, O.
 XL Refrigerating Co., Inc., Chicago, Ill.
 York Ice Machinery Corp., York, Pa.
 Young Radiator Co., Racine, Wis.

AIR CONDITIONING CONTROLS

See Controls; Heating, Ventilating and Air Conditioning Systems, Fan and Limit, Combustion, Limit, Thermostats, Humidistats, etc.

AIR CONDITIONING FURNACES

(Matched Furnace-fan-filter-humidifier unit)
See Furnaces, Air Conditioning

AIR CONDITIONING REGISTERS

See Registers, Directional Flow

AIR FILTERS

See Filters, Air

AIR WASHERS

See Washers, Air

ALLOY PLATES

See Plates, Alloy

ALLOY SHEETS

See Sheets, Alloy

ANALYZERS, FLUE GAS

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
 Ellison Draft Gage Co., Chicago, Ill.
 Harvey-Whipple, Inc., Springfield, Mass.
 Hays Corp., Michigan City, Ind.
 Leeds & Northrup Co., Philadelphia, Pa.
 • Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
 Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.

ANEMOMETERS

• Friez & Sons, Inc., Julien P., Baltimore, Md.
 Hill Co., Chicago, Ill.
 • Illinois Testing Laboratories, Inc., Chicago, Ill.
 Taylor Instrument Companies, Rochester, N. Y.

ANGLES, BARS, BEAMS, CHANNELS AND TEES (STRUCTURAL SHAPES)

Aluminum Company of America, Pittsburgh, Pa.
 • American Brass Co., Waterbury, Conn.
 • Bethlehem Steel Co., Bethlehem, Pa.
 Byers Co., A. M., Pittsburgh, Pa.
 Brasco Mfg. Co., Harvey, Ill.
 Carnegie-Illinois Steel Co., Pittsburgh, Pa.
 Chase Brass & Copper Co., Inc., Waterbury, Conn.
 Columbia Steel Co., San Francisco, Cal.
 Decatur Iron & Steel Co., Decatur, Ala.
 Gulf States Steel Co., Birmingham, Ala.
 Inland Steel Co., Chicago, Ill.
 International Steel Co., Evansville, Ind.
 Jones & Laughlin Steel Corp., Pittsburgh, Pa.
 Laclede Steel Co., St. Louis, Mo.
 • Milcor Steel Co., Milwaukee, Wis.
 • Republic Steel Corp., Cleveland, O.
 • Ryerson & Son, Inc., Jos. T., Chicago, Ill.
 Steel and Tubes, Inc., Cleveland, O.
 Stran-Steel Corp., Detroit, Mich.
 Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
 Truscon Steel Co., Youngstown, O.
 Weirton Steel Co., Weirton, W. Va.
 • Youngstown Sheet & Tube Co., Youngstown, O.

ARC WELDERS

See Welders, Arc

ASBESTOS PAPER

See Paper, Asbestos

ATTIC FANS

See Fans, Night Air Cooling

AUTOMATIC COAL BURNERS

See Stokers

AUTOMATIC HUMIDIFIERS

See Humidifiers, Furnace, Evaporation, Spray

BAND SAWS

See Saws, Band, Sheet Metal Cutting

BARS

See Angles, Bars, Beams, Channels and Tees (Structural Shapes)

BASES, VIBRATION ELIMINATING

Armstrong Cork Products Co., Lancaster, Pa. (Cork)
 • Buffalo Forge Co., Buffalo, N. Y.
 Cork Import Corp., New York City (Cork)
 Fabling Co., W. D., Los Angeles, Cal.
 Firestone Tire & Rubber Co., Akron, O.
 Goodrich Co., B. F., Akron, O. (Rubber)
 Korfund Co., Inc., Long Island City, N. Y.
 Lord Mfg. Co., Erie, Pa.
 Mundet Cork Corp., New York City.
 Rockwood Mfg. Co., Indianapolis, Ind. (Pivoted motor)
 Vibration Eliminator Co., Long Island City, N. Y. (Cork)

BEAMS

See Angles, Bars, Beams, Channels and Tees (Structural Shapes)

BEARINGS, FAN

Air Controls, Inc., Cleveland, O.
 Chicago Die Casting Co., Chicago, Ill. (Pillow Block)
 Fafnir Bearing Co., New Britain, Conn. (Ball)
 Grand Rapids Die & Tool Co., Grand Rapids, Mich.
 Jones Fdry. & Mach. Co., W. A., Chicago, Ill.
 Link-Belt Co., Chicago, Ill. (Pillow Block)
 Medart Co., St. Louis, Mo.
 New Departure Mfg. Co., Bristol, Conn. (Ball)
 Norma-Hoffman Bearings Corp., Stamford, Conn.
 Ohio Pattern Works & Foundry Co., Cincinnati, O.
 • Randall Graphite Products Corp., Chicago, Ill. (Pillow Block)
 Roller Bearing Co. of America, Trenton, N. J.
 • Schwitzer-Cummins Co., Indianapolis, Ind. (Pillow Block)
 S K F Industries, Inc., Philadelphia, Pa. (Ball and Roller, Pillow block)
 Viking Air Conditioning Corp., Cleveland, O.

BELTS, FLAT

Alexander Bros., Philadelphia, Pa.
 Continental Rubber Works, Erie, Pa. (Rubber and Fabric)
 Dick Co., Inc., R. & J., Passaic, N. J. (Balata and Rubber)
 Gilmer Co., L. H., Philadelphia, Pa.
 Goodrich Co., B. F., Akron, O. (Rubber)
 Goodyear Tire & Rubber Co., Akron, O.
 Graton & Knight, Worcester, Mass.
 Houghton & Co., E. F., Philadelphia, Pa.
 Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber)
 Rhodes & Sons, J. E., Philadelphia, Pa. (Leather)
 Thermoid Rubber Co., Trenton, N. J. (Rubber)

BELTS, V-TYPE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
 Continental Rubber Works, Erie, Pa.
 Dayton Rubber Mfg. Co., Dayton, O.
 Dick Co., Inc., R. & J., Passaic, N. J.
 Dodge Mfg. Corp., Mishawaka, Ind.
 Gates Rubber Co., Denver, Colo.
 Gilmer Co., L. H., Philadelphia, Pa.
 Goodrich Co., B. F., Akron, O.
 Goodyear Tire & Rubber Co., Akron, O.
 Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J.
 Ohio Valley Pulley Works, Maysville, Ky.
 Pyott Foundry & Machine Co., Chicago, Ill.
 Rockwood Mfg. Co., Indianapolis, Ind.
 Thermoid Rubber Co., Trenton, N. J.
 Wood's Sons Co., T. B., Chambersburg, Pa.
 Worthington Pump & Machinery Corp., Harrisburg, N. J.

BI-METALS, THERMOSTATIC

Callite Product Co., Union City, N. J.
Chace Valve Co., W. M., Detroit, Mich.
Wilson Co., H. A., Newark, N. J.

BLADES, FAN

Advance Aluminum Castings Corp., Chicago, Ill.
Airmaster Corp., Chicago, Ill.
●Autovent Fan & Blower Co., Chicago, Ill.
Champion Blower & Forge Co., Lancaster, Pa.
●Clarage Fan Co., Kalamazoo, Mich.
Economy Electric Mfg. Co., Cicero, Ill.
Grand Rapids Blow Pipe & Dust Arrester Co., Grand Rapids, Mich.
Janette Mfg. Co., Chicago, Ill.
Marathon Electric Mfg. Corp., Wausau, Wis.
Meier Electric & Machine Co., Indianapolis, Ind.
Myers Electric Co., Pittsburgh, Pa.
●National Fan & Blower Corp., Chicago, Ill.
●Peerless Electric Co., Warren, O.
Serval, Inc., Evansville, Ind.
Sturtevant Co., B. F., Hyde Park, Boston, Mass.
Steel and Tubes, Inc., Cleveland, O. (Stamping)
●Torrington Mfg. Co., Torrington, Conn.
Utility Fan & Mfg. Company, Los Angeles, Cal.
●Victor Electric Products, Inc., Cincinnati, O.

BLAST GATES

Airtherm Mfg. Co., St. Louis, Mo.
●Berger Bros. Co., Philadelphia, Pa.
Blower Application Co., Milwaukee, Wis.
●Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
●Clarage Fan Co., Kalamazoo, Mich.
Garden City Fan Co., Chicago, Ill.
Goethel Sheet Metal Works, Alfred, Milwaukee, Wis.
Goethel Co., Alfred C., Milwaukee, Wis.
Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids, Mich.
Kirk & Blum Mfg. Co., Cincinnati, O.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
R-S Products Corp., Philadelphia, Pa.
Sturtevant Co., B. F., Hyde Park, Boston, Mass.
Western Blower Co., Seattle, Wash.

BLINDS, VENETIAN

Athey Co., Chicago, Ill.
Bostwick-Goodell Co., Norwalk, O.
Chicago Venetian Blind Co., Chicago, Ill.
Columbia Mills, Inc., Saginaw, Mich.
Higgin Mfg. Co., Newport, Ky.
Hough Co., Janesville, Wis.
Kane Mfg. Co., Kane, Pa.
Miller & Connell Co., Chicago, Ill.
Mitchell Moulding Co., Forest Park, Ill.
Patterson Shade Co., Indianapolis, Ind.
Schatz Venetian Blinds, Los Angeles, Cal.
Swedish Venetian Blind Co., New York, N. Y.
Warren Shade Co., Inc., Minneapolis, Minn.
Western Venetian Blind Co., New York, N. Y.
Yardley Screen & Weather Strip Corp., Columbus, O.

BLOWER—FILTER UNITS

●Air Conditioning Equipment Co., Minneapolis, Minn.
Air Controls, Inc., Cleveland, O.
Aladdin Heating Corp., Oakland, Cal.
●American Foundry & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis, Mo.
Ames Co., W. R., San Francisco, Cal.
Arcweld Mfg. Co., Inc., Seattle, Wash.
Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.
Baker Furnace & Cleaner Mfg. Co., Toledo, O.
Bishop & Babcock Sales Co., Cleveland, O.
Blower Application Co., Milwaukee, Wis.
Brown Sheet Iron & Steel Co., St. Paul, Minn.
Brundage Co., Kalamazoo, Mich.
Bryan Plumbing & Heating Co., Bryan, O.
●Buffalo Forge Co., Buffalo, N. Y.
Campbell Heating Co., Des Moines, Ia.
Champion Blower & Forge Co., Lancaster, Pa.
●Dall Steel Products Co., Lansing, Mich.
Des Moines Steel Furnace Co., Des Moines, Ia.
Dowagiac Steel Furnace Co., Dowagiac, Mich.
Economy Baler Co., Ann Arbor, Mich.
Electrogas Furnace & Mfg. Co., San Francisco, Cal.
●Emerson Electric Mfg. Co., St. Louis, Mo.
Evans Corp., George, Moline, Ill.
Falstrom Co., Passaic, N. J.
Farquhar Furnace Co., Wilmington, O.
●Fox Furnace Co., Elyria, O.
●Furblo Co., Hermansville, Mich.

Gehri Co., Tacoma, Wash.
Green Foundry & Furnace Works, Des Moines, Ia.
●Hall-Neal Furnace Co., Indianapolis, Ind.
Health Air Systems, Inc., Detroit, Mich.
●Henry Furnace & Foundry Co., Cleveland, O.
●Hess Warming & Ventilating Co., Chicago, Ill.
●"Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.
Jaden Mfg. Co., Inc., F., Hastings, Nebr.
Kais Sunrise Works, Detroit, Mich.
Kelsey Heating Co., Syracuse, N. Y.
Kruse Co., Inc., Indianapolis, Ind.
●Lau Blower Co., Dayton, O.
Lennox Furnace Co., Marshalltown, Ia.
Lewis Air Conditioners, Inc., Minneapolis, Minn.
MaGill Foundry & Furnace Works, P. H., Bloomington, Ill.
Marshall Furnace Co., Marshall, Mich.
McPherson Furnace & Supply Co., Portland, Ore.
Mellish & Murray Co., Chicago, Ill.
●Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
●Mueller Furnace Co., L. J., Milwaukee, Wis.
Nelson Co., Detroit, Mich.
Nelson Corp., Herman, Moline, Ill.
Nomis Corp., Lafayette, Ind.
●Pacific Gas Radiator Co., Los Angeles, Cal.
●Payne Furnace & Supply Co., Beverley Hills, Cal.
●Peerless Electric Co., Warren, O.
●Peerless Foundry Co., Indianapolis, Ind.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Perfect Burner, Lynn, Mass.
●Premier Furnace Co., Dowagiac, Mich.
Roberts-Hamilton Co., Minneapolis, Minn.
Robeson Engineering Co., East Orange, N. J.
Round Oak Co., Dowagiac, Mich.
●Rudy Furnace Co., Dowagiac, Mich.
●Russell Electric Co., Chicago, Ill.
●Schwitzer-Cummins Co., Indianapolis, Ind.
Spray-Wheel Air Conditioners, Inc., Denver, Colo.
Texo Sales & Mfg. Co., Cincinnati, O.
Thatcher Co., Newark, N. J.
●U. S. Air Conditioning Corp., Minneapolis, Minn.
Utility Fan & Mfg. Co., Los Angeles, Cal.
Viking Air Conditioning Corp., Cleveland, O.
●Waterman-Waterbury Co., Minneapolis, Minn.
Western Blower Co., Seattle, Wash.
●Wise Furnace Co., Akron, O.

BLOWER—WASHER UNITS

●American Foundry & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis, Mo.
American Machine Products Co., Marshalltown, Ia.
Ames Co., W. R., San Francisco, Cal.
Arcweld Mfg. Co., Inc., Seattle, Wash.
Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.
Bishop & Babcock Sales Co., Cleveland, O.
Blower Application Co., Milwaukee, Wis.
Brown Sheet Iron & Steel Co., St. Paul, Minn.
Brundage Co., Kalamazoo, Mich.
Bryan Plumbing & Heating Co., Bryan, O.
●Buffalo Forge Co., Buffalo, N. Y.
Campbell Heating Co., Des Moines, Ia.
Champion Blower & Forge Co., Lancaster, Pa.
●Dall Steel Products Co., Lansing, Mich.
Dowagiac Steel Furnace Co., Dowagiac, Mich.
Economy Baler Co., Ann Arbor, Mich.
Electrogas Furnace & Mfg. Co., San Francisco, Cal.
Falstrom Co., Passaic, N. J.
●Furblo Co., Hermansville, Mich.
Gehri Co., Tacoma, Wash.
Health Air Systems, Inc., Detroit, Mich.
King Ventilating Co., Owatonna, Minn.
●Lau Blower Co., Dayton, O.
MaGill Foundry & Furnace Works, P. H., Bloomington, Ill.
Mellish & Murray Co., Chicago, Ill.
●Meyer Furnace Co., Peoria, Ill.
Montag Stove & Furnace Works, Portland, Ore.
●Mueller Furnace Co., L. J., Milwaukee, Wis.
●National Fan & Blower Corp., Chicago, Ill.
Nelson Co., Detroit, Mich.
●Pacific Gas Radiator Co., Los Angeles, Cal.
Robeson Engineering Co., East Orange, N. J.
Round Oak Co., Dowagiac, Mich.
●Rudy Furnace Co., Dowagiac, Mich.
Spray-Wheel Air Conditioners, Inc., Denver, Colo.
Stilphen Engineering & Mfg. Co., C. A., Denver, Colo.
Sturtevant Co., B. F., Hyde Park, Boston, Mass.
●U. S. Air Conditioning Corp., Minneapolis, Minn.
●Waterman-Waterbury Co., Minneapolis, Minn.
●Wise Furnace Co., Akron, O.

BLOWERS, FORCED DRAFT

American Blower Corp., Detroit, Mich.
●American Foundry & Furnace Co., Bloomington, Ill.
Arex Co., Chicago, Ill.
●Autovent Fan & Blower Co., Chicago, Ill.

- Bignall Co., Medina, N. Y.
 Blower Application Co., Milwaukee, Wis.
 Brown Corp., Syracuse, N. Y.
 ●Buffalo Forge Co., Buffalo, N. Y.
 Burdett Mfg. Co., Chicago, Ill.
 Burnwell Corp., Allentown, Pa.
 Champion Blower & Forge Co., Lancaster, Pa.
 ●Clarage Fan Co., Kalamazoo, Mich.
 Coal Carburetor Co., New Brunswick, N. J.
 Economy Electric Mfg. Co., Cicero, Ill.
 Electrovent Fan & Mfg. Co., Chicago, Ill.
 Falstrom Co., Passaic, N. J.
 Fuel Savers, Inc., Harrisburg, Pa.
 Garden City Fan Co., Chicago, Ill.
 General Blower Co., Philadelphia, Pa.
 Health Air Systems, Inc., Detroit, Mich.
 Mohler Co., J. K., Ephrata, Pa.
 Muncie Gear Works, Inc., Muncie, Ind.
 New York Blower Co., Chicago, Ill.
 ●Pacific Gas Radiator Co., Los Angeles, Cal.
 ●Peerless Electric Co., Warren, O.
 Roberts-Hamilton Co., Minneapolis, Minn.
 ●Schwitzer-Cummins Co., Indianapolis, Ind.
 Spray-Wheel Air Conditioners, Inc., Denver, Colo.
 Sturtevant Co., B. F., Hyde Park, Boston, Mass.
 ●Universal Blower Co., Birmingham, Mich.
 Wing Mfg. Co., L. J., New York City.
 ●Wise Furnace Co., Akron, O.

BLOWERS, FURNACE, CENTRIFUGAL

- Air Conditioning Equipment Co., Minneapolis, Minn.
 Air Controls, Inc., Cleveland, O.
 American Blower Corp., Detroit, Mich.
 ●American Foundry & Furnace Co., Bloomington, Ill.
 American Furnace Co., St. Louis, Mo.
 American Machine Products Co., Marshalltown, Ia.
 Ames Co., W. R., San Francisco, Cal.
 Arcweld Mfg. Co., Inc., Seattle, Wash.
 Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.
 ●Autovent Fan & Blower Co., Chicago, Ill.
 Bishop & Babcock Sales Co., Cleveland, O.
 Brown Sheet Iron & Steel Co., St. Paul, Minn.
 Brundage Co., Kalamazoo, Mich.
 Bryan Plumbing & Heating Co., Bryan, O.
 ●Buffalo Forge Co., Buffalo, N. Y.
 Campbell Heating Co., E. K., Kansas City, Mo.
 Campbell Heating Co., Des Moines, Ia.
 Champion Blower & Forge Co., Lancaster, Pa.
 ●Chandler Co., Cedar Rapids, Ia.
 ●Chicago Steel Furnace Co., Chicago, Ill.
 ●Clarage Fan Co., Kalamazoo, Mich.
 ●Dall Steel Products Co., Lansing, Mich.
 Des Moines Steel Furnace Co., Des Moines, Ia.
 Economy Baler Co., Ann Arbor, Mich.
 Electrogas Furnace & Mfg. Co., San Francisco, Cal.
 ●Emerson Electric Mfg. Co., St. Louis, Mo.
 Falstrom Co., Passaic, N. J.
 ●Furblo Co., Hermansville, Mich.
 Garden City Fan Co., Chicago, Ill.
 Gehri Co., Tacoma, Wash.
 General Blower Co., Philadelphia, Pa.
 Grand Rapids Die & Tool Co., Grand Rapids, Mich.
 ●Hess Warming & Ventilating Co., Chicago, Ill.
 ●"Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.
 Ideal Furnace Co., Detroit, Mich.
 Jaden Mfg. Co., Inc., F., Hastings, Nebr.
 Janette Mfg. Co., Chicago, Ill.
 ●Lau Blower Co., Dayton, O.
 Mahr Mfg. Co., Minneapolis, Minn.
 Marshall Furnace Co., Marshall, Mich.
 ●Meyer Furnace Co., Peoria, Ill.
 Montag Stove & Furnace Works, Portland, Ore.
 ●Mueller Furnace Co., L. J., Milwaukee, Wis.
 ●National Fan & Blower Corp., Chicago, Ill.
 Nelson Co., Detroit, Mich.
 Nelson Corp., Herman, Moline, Ill.
 New York Blower Co., Chicago, Ill.
 Niagara Blower Co., New York City.
 ●Pacific Gas Radiator Co., Los Angeles, Cal.
 ●Peerless Electric Co., Warren, O.
 ●Premier Furnace Co., Dowagiac, Mich.
 Robeson Engineering Co., East Orange, N. J.
 Roots-Connersville Blower Corp., Connersville, Ind.
 Security Stove & Mfg. Co., Kansas City, Mo.
 ●Schwitzer-Cummins Co., Indianapolis, Ind.
 Spear Stove & Heating Co., Jas., Philadelphia, Pa.
 Spray-Wheel Air Conditioners, Inc., Denver, Colo.
 ●U. S. Air Conditioning Corp., Minneapolis, Minn.
 Utility Fan & Mfg. Co., Los Angeles, Cal.
 Viking Air Conditioning Corp., Cleveland, O.
 ●Waterman-Waterbury Co., Minneapolis, Minn.
 Western Blower Co., Seattle, Wash.
 Wing Mfg. Co., L. J., New York City

BLOWERS, VENTILATING SYSTEM

(Capacity 4,000 c.f.m. up)

- Air Controls, Inc., Cleveland, O.
 American Blower Corp., Detroit, Mich.
 American Coolair Corp., Jacksonville, Fla.
 ●American Foundry & Furnace Co., Bloomington, Ill.
 Ames Co., W. R., San Francisco, Cal.
 Arcweld Mfg. Co., Inc., Seattle, Wash.
 Arex Co., Chicago, Ill.
 Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.
 ●Autovent Fan & Blower Co., Chicago, Ill.
 Barrett Engineers, Cleveland Heights, O.
 Bayley Blower Co., Milwaukee, Wis.
 Bishop & Babcock Sales Co., Cleveland, O.
 Brown Sheet Iron & Steel Co., St. Paul, Minn.
 Brundage Co., Kalamazoo, Mich.
 ●Buffalo Forge Co., Buffalo, N. Y.
 Burt Mfg. Co., Akron, O.
 Campbell Heating Co., E. K., Kansas City, Mo.
 Champion Blower & Forge Co., Lancaster, Pa.
 ●Clarage Fan Co., Kalamazoo, Mich.
 Coppus Engineering Corp., Worcester, Mass.
 De Bothezat Corp., Div. American Machine & Metals, Inc., New York City.
 Des Moines Steel Furnace Co., Des Moines, Iowa.
 Duriron Co., Inc., Dayton, O. (Acid Resisting)
 Economy Electric Mfg. Co., Cicero, Ill.
 ●Emerson Electric Mfg. Co., St. Louis, Mo.
 Evry-Use Products, Inc., New York City
 Falstrom Co., Passaic, N. J.
 ●Furblo Co., Hermansville, Mich.
 Garden City Fan Co., Chicago, Ill.
 General Blower Co., Philadelphia, Pa.
 Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids, Mich.
 Grand Rapids Die & Tool Co., Grand Rapids, Mich.
 Hartzell Propeller Fan Co., Piqua, O.
 Health Air Systems, Inc., Detroit, Mich.
 Hig Electric Ventilating Co., Chicago, Ill.
 Johnson Fan & Blower Corp., Chicago, Ill.
 ●Lau Blower Co., Dayton, O.
 MaGill Foundry & Furnace Works, P. H., Bloomington, Ill.
 Mechanical Air, Little Rock, Ark.
 ●National Fan & Blower Corp., Chicago, Ill.
 Nelson Co., Detroit, Mich.
 New York Blower Co., Chicago, Ill.
 Niagara Blower Co., New York City
 ●Pacific Gas Radiator Co., Los Angeles, Cal.
 Perkins & Son, Inc., B. F., Holyoke, Mass.
 Peterson Freezem Mfg. Co., Kansas City, Mo.
 Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
 Roberts-Hamilton Co., Minneapolis, Minn.
 Roots-Connersville Blower Corp., Connersville, Ind.
 Round Oak Co., Dowagiac, Mich.
 ●Russell Electric Co., Chicago, Ill.
 ●Schwitzer-Cummins Co., Indianapolis, Ind.
 Spray-Wheel Air Conditioners, Inc., Denver, Colo.
 Star Electric Motor Co., Bloomfield, N. J.
 Sturtevant Co., B. F., Hyde Park, Boston, Mass.
 ●U. S. Air Conditioning Corp., Minneapolis, Minn.
 Utility Fan & Mfg. Co., Los Angeles, Cal.
 ●Victor Electric Products, Inc., Cincinnati, O.
 Western Blower Co., Seattle, Wash.
 Wing Mfg. Co., L. J., New York City

BLOWER WHEELS

See Wheels, Blower

BLOW PIPE EQUIPMENT

See Blast Gates; Collectors, Blow Pipe; Fittings, Blow Pipe

BLOW TORCHES

See Torches, Brazing, Cutting, Welding, Soldering

BOOSTER FANS

See Fans, Booster

BOOTS, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

BRAKES, METAL WORKERS', HAND

- Allsteel Press Co., Inc., Chicago, Ill.
 Bertsch & Co., Cambridge City, Ind.
 ●Dreis & Krump Mfg. Co., Chicago, Ill.
 Eiker Mfg. Co., The, Ogallala, Nebr.
 Excelsior Tool and Machine Co., East St. Louis, Ill.
 Glascock Bros. Mfg. Co., Muncie, Ind.
 New Albany Machine Mfg. Co., New Albany, Ind.
 ●Niagara Machine & Tool Works, Buffalo, N. Y.
 ●Peck, Stow & Wilcox Co., Southington, Conn.
 Steelweld Machinery Co., Cleveland, O.
 ●Whitney Metal Tool Co., Rockford, Ill.

BRAKES, METAL WORKERS', POWER

- Allsteel Press Co., Inc., Chicago, Ill.
- Bertsch & Co., Cambridge City, Ind.
- Cincinnati Shaper Co., Cincinnati, O.
- Dreis & Krump Mfg. Co., Chicago, Ill.
- Heartley Machine & Tool Co., Toledo, O.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Ohl & Co., Geo. A., Newark, N. J.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Rafter Machine Co., Belleville, N. J.
- Whitney Metal Tool Co., Rockford, Ill.

BRAZING TORCHES

See Torches, Brazing, Cutting, Welding

BRUSHES, ACID

- Cleveland Brush Factory, Inc., Cleveland, O.
- Lukens Metal Co., Thos. F., Philadelphia, Pa.
- Meyer & Bro. Co., F., Peoria, Ill.
- Milwaukee Brush Mfg. Co., Milwaukee, Wis.
- Osborn Mfg. Co., Cleveland, O.
- Potomac Mfg. Co., Philadelphia, Pa.
- Schaefer Brush Mfg. Co., Milwaukee, Wis.

BRUSHES, FURNACE

- Cleveland Brush Factory, Inc., Cleveland, O.
- Mill-Rose Co., Cleveland, O.
- Milwaukee Brush Mfg. Co., Milwaukee, Wis.
- Osborn Mfg. Co., Cleveland, O.
- Pilley Packing & Flue Brush Mfg. Co., St. Louis, Mo.
- Schaefer Brush Mfg. Co., Milwaukee, Wis.
- Swift Corp., Carl E., Holland, Mich.
- Worcester Brush & Scraper Co., Worcester, Mass.

BUILDING INSULATION

See Insulation, Building

BURNERS, GAS, CONVERSION

- American Gas Products Corp., New York City.
- Autogas Corp., Chicago, Ill.
- Barber Gas Burner Co., Cleveland, O.
- Beck Engineering Combustion Kompany, St. Louis, Mo.
- Bryan Steam Corp., Peru, Ind.
- Bryant Corp., C. L., Cleveland, O.
- Bryant Heater Co., Cleveland, O.
- Burdett Mfg. Co., Chicago, Ill.
- Columbia Burner Co., Toledo, O.
- Continental Stove Corp., Ironton, O.
- Franklin Gas Appliance Co., Cincinnati, O.
- Johnson Gas Appliance Co., Cedar Rapids, Iowa.
- Leahy Mfg. Co., Los Angeles, Cal.
- National Machine Works, Chicago, Ill.
- R-S Products Corp., Philadelphia, Pa.
- Roberts-Gordon Appliance Corp., Buffalo, N. Y.
- Rotary Mfg. Co., Los Angeles, Cal.
- Scott-Newcomb, Inc., St. Louis, Mo.
- Security Stove & Mfg. Co., Kansas City, Mo.
- Sonner Burner Co., Winfield, Kan.
- Standard Heating & Radiator Co., Pittsburgh, Pa.
- Surface Combustion Corp., Toledo, O.
- Delco-Frigidaire Conditioning Div., General Motors Sales Corp., Dayton, O.
- D'Elia Oil Burner Co., Inc., Bridgeport, Conn. (Gun)
- Easternoll, Inc., Portland, Me. (Gun)
- Electrol, Inc., Clifton, N. J.
- Elec-Tro-Matic Oil Burner Co., Cedarhurst, L. I., N. Y. (Gun)
- Enterprise Oil Burner Co., San Francisco, Cal. (Horizontal rotary)
- Excello Oil Heating Corp., Omaha, Nebr.
- French Rotary Oil Burner Co., Sebastopol, Cal. (Gun)
- General Electric Co., Schenectady, N. Y.
- General Oil Heating Corp., West New York, N. J. (Gun)
- Gilbert & Barker Mfg. Co., Springfield, Mass. (Gun)
- Gold Star Oil Burner Mfg. Co., Inc., Yonkers, N. Y. (Gun)
- Green Foundry & Furnace Works, Des Moines, Ia. (Gun)
- Grinnell Washing Machine Corp., Grinnell, Ia.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Hardinge Oil Burner Co., Chicago, Ill.
- Hart Oil Burner Corp., Peoria, Ill. (Gun)
- Harvey-Whipple, Inc., Springfield, Mass. (Gun)
- Hell Co., Milwaukee, Wis. (Gun)
- Hipoint Corp., Bellefontaine, O.
- Holtum Mfg. Co., Freeport, Ill. (Gun)
- Home Oil Burner Corp., Hempstead, N. Y. (Gun)
- Hotentot Co., Inc., Omaha, Nebr. (Gun and gravity)
- Hubbard Co., Minneapolis, Minn. (Gun)
- Hupp Oil Burner Co., Inc., Brooklyn, N. Y. (Gun)
- Ingle Mfg. Co., San Diego, Cal. (Gravity)
- Iowa Foundry Co., Sioux City, Ia.
- Johnson Co., S. T., Oakland, Cal. (Rotary)
- Johnson Mfg. Co., Waterloo, Ia. (Gun)
- Johnston Mfg. Co., Minneapolis, Minn. (Gun)
- Kals Sunrise Works, Detroit, Mich. (Gravity and rotary)
- Kaybar Burner Corp., Chicago, Ill.
- Kelvinator Corp., Detroit, Mich. (Gun)
- Kisco Co., Inc., St. Louis, Mo.
- Kleen Heat, Inc., Chicago, Ill. (Gun)
- Laco Oil Burner Co., Griswold, Ia.
- Leahy Mfg. Co., Los Angeles, Cal.
- Leeson Co., T. F., Detroit, Mich. (Gun)
- Little Burner Co., Inc., H. C., San Rafael, Cal. (Gravity)
- Littleford Bros., Cincinnati, O.
- Lynn Products Co., Lynn, Mass. (Gravity)
- Mahan Oil Burner & Furnace Co., Elmhurst, Ill. (Gravity)
- Malleable Iron Fittings Co., Branford, Conn. (Gun)
- May Oil Burner Corp., Baltimore, Md. (Gun)
- Mayflower Oil Burner Corp., West New York, N. J. (Gun)
- McIlvaine Burner Corp., Chicago, Ill.
- Micro-Westco, Inc., Bettendorf, Iowa.
- Morrissey & Co., Chicago, Ill. (Gun)
- Motor Wheel Corp., Lansing, Mich. (Gun)
- National Alroil Burner Co., Philadelphia, Pa. (Gun)
- Nelson Co., Detroit, Mich. (Gun)
- Nelson Corp., Herman, Moline, Ill.
- Nomis Corporation, The, Lafayette, Ind.
- Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.
- Nu-Way Corp., Rock Island, Ill.
- Oil Burner Builders, Inc., Bellevue, Ia. (Gun)
- Pan American Engineering Corp., Ltd., Berkeley, Cal. (Gun, rotary and turbine)
- Peerless Oil Burner Co., Inc., Kansas City, Mo. (Gravity)
- Peoples Oil Burner Co., Chicago, Ill. (Gravity)
- Perfect Burner Co., Lynn, Mass. (Gun)
- Perfection Stove Co., Cleveland, O.
- Petroleum Heat & Power Co., Stamford, Conn. (Rotary, gravity and gun)
- Phillips Heating, Ventilating & Mfg. Co., Los Angeles, Cal. (Gravity)
- Pioneer Oil Burner Co., Cedar Rapids, Ia.
- Pressure Oil Burners, Inc., York, Pa. (Gun)
- R-S Products Corp., Philadelphia, Pa. (Gun)
- Ray Oil Burner Co., San Francisco, Cal. (Gun and rotary)
- Reif-Rexoil, Inc., Buffalo, N. Y.
- Rotary Mfg. Co., Los Angeles, Cal. (Rotary)
- Scott-Newcomb, Inc., St. Louis, Mo. (Gun)
- Sentry Mfg. Co., Omaha, Nebr. (Gun)
- Shedlov Oil Burners, Inc., Minneapolis, Minn. (Gravity and gun)
- Silent Glow Oil Burner Corp., Hartford, Conn.
- Silent Sioux City Burner Corp., Orange City, Ia. (Gravity)
- Simplex Oil Heating Corp., New York City (Gun, rotary and turbine)
- Skinner Co., E. W., Fitchburg, Mass. (Gravity)
- Summerheat Co., South Bend, Ind. (Low pressure)
- Sundstrand Sales Co., Rockford, Ill. (Gun)
- Sun-Ray Oil Burner Corp., Rockaway Park, N. Y. (Gun)
- Synco-Flame Burner Corp., Hartford, Conn. (Gun)
- Timken Silent Automatic Co., Detroit, Mich. (Gun and rotary)
- Todd Combustion Equipment, Inc., Brooklyn, N. Y.
- Uni-Fire Co., Detroit, Mich. (Rotary)
- United States Burner Corp., Hartford, Conn. (Gun and rotary)
- Valley Mfg. Co., Athol, Mass. (Gun and rotary)
- Victor Oil Burner Mfg. Co., Hartford, Conn. (Gravity)
- Volcano Burner Corp., New York City. (Gun)
- Wayne Oil Burner Corp., Fort Wayne, Ind. (Gun)
- Weiskittel Co., Inc., Harry C., Baltimore, Md.
- Westchester Home Equipment Co., Inc., Bronx, N. Y. (Gun)
- Westwick & Son, Inc., John, Galena, Ill. (Gun)
- Williams Oil-O-Matic Heating Corp., Bloomington, Ill. (Gun)
- Wood Industries, Inc., Gar, Detroit, Mich. (Gun)
- Woolery Machine Co., Minneapolis, Minn. (Gun)
- York Oil Burner Co., Inc., York, Pa. (Gun)

BURNERS, OIL

- Ace Engineering Co., Chicago, Ill. (Rotary)
- Acme Oil Burner Company, Inc., Cedar Rapids, Ia. (Gun)
- Airtemp, Inc., Dayton, O.
- Aldrich Co., Peoria, Ill.
- Anchor Post Fence Co., Baltimore, Md. (Gun and rotary)
- Arcweld Mfg. Co., Inc., Seattle, Wash.
- Auburn Burner Corp., Auburn, Ind. (Gun and rotary)
- Autocrat Oil Burner Corp., Cedar Rapids, Ia.
- Automatic Burner Corp., Chicago, Ill. (Gun and rotary)
- Badger Mfg. Co., Madison, Wis. (Gun)
- Ballard, Inc., Arthur H., Boston, Mass.
- Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.
- Bennett Corp., W. M., Omaha, Nebr. (Gun)
- Berryman Oil Burner Co., Chicago, Ill.
- Bethlehem Foundry & Machine Co., Bethlehem, Pa. (Gun)
- Braden Engineering, Inc., Providence, R. I. (Pressure gun)
- Brigham Oil Burner Co., St. Louis, Mo. (Gun and gravity)
- Brown Oil Burning Equipment Co., Cambridge, Mass. (Gun and rotary)
- Bryan Steam Corp., Peru, Ind. (Rotary and gun)
- Caloroll Burner Corp., Hartford, Conn. (Atmospheric, gun, horizontal, rotary, vacuum pressure, wall flame)
- Carter-Korth Oil Burner Corp., Roselle Park, N. J.
- Cary Mfg. Co., Waupaca, Wis. (Gravity)
- Century Engineering Corp., Cedar Rapids, Ia. (Gun)
- Chalmers Oil Burner Co., Minneapolis, Minn. (Gun and rotary)
- Chicago Steel Furnace Co., Chicago, Ill.
- Cleveland Steel Products Corp., Cleveland, O. (Gun and rotary)

CABINET HEATERS*See Heaters, Cabinet***CABINETS AND CASINGS**

- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Geuder, Paeschke & Frey Co., Milwaukee, Wis.
- Martin-Parry Corp., York, Pa.
- Mullins Mfg. Corp., Salem, O.
- Youngstown Pressed Steel Co., Warren, O.

CAPS AND TOPS, CHIMNEY

- Accurate Mfg. Works, Chicago, Ill.
- Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.
- Adams Co., Dubuque, Ia.
- Allen Corp., Detroit, Mich.
- Ames Co., W. R., San Francisco, Cal.
- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Decatur Iron & Steel Co., Decatur, Ala.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Hirschman Co., Inc., W. F., Buffalo, N. Y.
- Iwan Brothers, South Bend, Ind.
- Kleenaire Corp., Stevens Point, Wis.
- Lamb & Ritchie Co., Cambridge, Mass.
- Martin Metal Mfg. Co., Wichita, Kan.
- Meyer & Bro. Co., F., Peoria, Ill.
- Milcor Steel Co., Milwaukee, Wis.
- Neemes Foundry, Inc., Troy, N. Y.
- Providence Cornice Co., Providence, R. I.
- Rynliker Sheet Metal Works, Inc., Billings, Mont.
- Schoedinger Co., F. O., Columbus, O.
- Southbridge Roofing Co., Inc., Southbridge, Mass.
- Sterling Foundry Company, Sterling, Ill. (Cast iron)
- Tierney Rotor Ventilator Co., Minneapolis, Minn.
- Vall Mfg. Co., Fort Wayne, Ind.
- Vermont Structural Slate Co., Fair Haven, Vt.
- Watson Co., Inc., Jas. H., Bradley, Ill.

CASINGS*See Cabinets and Casings***CAULKING COMPOUNDS***See Compounds, Caulking***CEILINGS, METAL**

- Berger Mfg. Div. of Truscon Steel Corp., Canton, O.
- Berger Mfg. Co., Div. Republic Steel Corp., Canton, O.
- Brooklyn Metal Ceiling Co., Brooklyn, N. Y.
- Canton Steel Ceiling Mfg. Co., Canton, O.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Friedley-Voshardt Co., Chicago, Ill.
- International Steel Co., Evansville, Ind.
- Klauer Mfg. Co., Dubuque, Ia.
- Mesker & Co., Geo. L., Evansville, Ind.
- Milcor Steel Co., Milwaukee, Wis.
- Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
- Reeves Mfg. Co., Dover, O.
- St. Paul Corrugating Co., St. Paul, Minn.
- Schoedinger Co., F. O., Columbus, O.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (Galvanized steel beaded)
- Watson Co., Inc., Jas. H., Bradley, Ill.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Woolwine Metal Products Co., Los Angeles, Cal.

CEMENT, ASBESTOS

- Certain-teed Products Corp., New York City.
- Clinton Metallic Paint Co., Clinton, N. Y.
- Connors Paint Mfg. Co., Wm., Troy, N. Y.
- Eagle-Picher Lead Co., Cincinnati, O.
- Ehret Magnesia Mfg. Co., Valley Forge, Pa.
- Johns-Manville, New York City.
- Keasbey & Mattison Co., Ambler, Pa.
- Laclede-Christy Clay Products Co., St. Louis, Mo.
- Norristown Magnesia & Asbestos Co., Norristown, Pa.
- Ohmlac Paint & Refining Co., Chicago, Ill.
- Pecora Paint Co., Philadelphia, Pa.
- Ruberoid Co., New York City.
- Rutland Fire Clay Co., Rutland, Vt.
- Sall Mountain Co., Chicago, Ill.
- Smith & Kanzler, Inc., Elizabeth, N. J.
- Standard Asbestos Mfg. Co., Chicago, Ill.
- Tamms Silica Co., Chicago, Ill.
- Thompson & Co., Pittsburgh, Pa.
- Wilhelm Co., A., Reading, Pa.
- Wilson, Inc., Grant, Chicago, Ill.

CEMENT, FURNACE

- Acme Refining Co., Cleveland, O.
- Armstrong Co., Detroit, Mich.
- Barber Co., Inc., Philadelphia, Pa.
- Buckeye Products Co., Cincinnati, O.

- Carey Co., Philip, Lockland, Cincinnati, O.
- Clinton Metallic Paint Co., Clinton, N. Y.
- Connors Paint Mfg. Co., Wm., Troy, N. Y.
- Continental Products Co., Euclid, O.
- Eagle-Picher Lead Co., Cincinnati, O.
- Ehret Magnesia Mfg. Co., Valley Forge, Pa.
- Fireline Stove & Furnace Lining Co., Chicago, Ill.
- Hetzel Roofing Products Co., Newark, N. J.
- Iowa Paint Mfg. Co., Des Moines, Ia.
- Johns-Manville, New York City.
- Keasbey & Mattison Co., Ambler, Pa.
- Laclede-Christy Clay Products Co., St. Louis, Mo.
- Lastik Products Co., Inc., Pittsburgh, Pa.
- Pecora Paint Co., Philadelphia, Pa.
- Plastic Products Co., Detroit, Mich.
- Presstite Engineering Co., St. Louis, Mo.
- Pyrolite Products Co., Cleveland, O.
- Ramitite Co., Chicago, Ill.
- Ruberoid Co., New York City.
- Rutland Fire Clay Co., Rutland, Vt.
- Sauereisen Cements Co., Sharpsburg, Pa.
- Standard Asbestos Mfg. Co., Chicago, Ill.
- Standard Fuel Engineering Co., Detroit, Mich.
- Tamms Silica Co., Chicago, Ill.
- Walsh Refractories Corp., St. Louis, Mo.
- Wilhelm Co., A., Reading, Pa.
- Williamson Heater Co., Cincinnati, O.
- Wilson, Inc., Grant, Chicago, Ill.

CEMENT, ROOF

- Acme Refining Co., Cleveland, O. (Liquid and plastic)
- All States Roofers Equipment & Material Co., Chicago, Ill.
- Barber Co., Inc., Philadelphia, Pa.
- Barrett Co., New York City.
- Bird & Son, Inc., East Walpole, Mass.
- Calbar Paint & Varnish Co., Philadelphia, Pa.
- Carey Co., Philip, Cincinnati, O.
- Carter Paint Co., Liberty, Ind.
- Certain-teed Products Corp., New York City.
- Clinton Metallic Paint Co., Clinton, N. Y.
- Connors Paint Mfg. Co., Wm., Troy, N. Y.
- Continental Products Co., Euclid, O.
- Ehret Magnesia Mfg. Co., Valley Forge, Pa.
- Flintkote Co., New York City.
- Glidden Co., Cleveland, O.
- Hetzel Roofing Products Co., Newark, N. J.
- Horn Co., A. C., Long Island City, N. Y.
- Iowa Paint Mfg. Co., Des Moines, Ia. (Asphalt)
- Johns-Manville, New York City.
- Koppers Products Co., Pittsburgh, Pa.
- Lastik Products Co., Inc., Pittsburgh, Pa.
- National Mfg. Corp., Tonawanda, N. Y.
- Ohmlac Paint & Refining Co., Chicago, Ill.
- Pecora Paint Co., Philadelphia, Pa. (Asbestos)
- Presstite Engineering Co., St. Louis, Mo.
- Pyrolite Products Co., Cleveland, O.
- Ruberoid Co., New York City.
- Rutland Fire Clay Co., Rutland, Vt.
- Thompson & Co., Pittsburgh, Pa.
- Tropical Paint & Oil Co., Cleveland, O.
- United States Gypsum Co., Chicago, Ill.
- Wilhelm Co., A., Reading, Pa.

CHAIN, FURNACE

- American Chain Co., Inc., Bridgeport, Conn.
- Bead Chain Mfg. Co., Bridgeport, Conn.
- Bridgeport Chain & Mfg. Co., Bridgeport, Conn.
- Chain Products Co., Cleveland, O.
- Corbin Screw Corp., New Britain, Conn.
- Hart & Cooley Mfg. Co., Chicago, Ill.
- Russell Mfg. Co., John M., Naugatuck, Conn.
- Turner & Seymour Mfg. Co., Torrington, Conn.

CHANNELS*See Angles, Bars, Beams, Channels and Tees (Structural Shapes)***CLEANERS, VACUUM, FURNACE**

- Arco Vacuum Corp., New York City.
- Baker Furnace & Cleaner Mfg. Co., Toledo, O.
- Breuer Electric Mfg. Co., Chicago, Ill.
- Brillion Furnace Co., Brillion, Wis.
- Christie Cleaner Co., Cincinnati, O.
- Densmore-Quinlan Co., Kenosha, Wis.
- Electric Vacuum Cleaner Co., Inc., Cleveland, O.
- Grand Rapids Furnace Cleaner Co., Grand Rapids, Mich.
- Holland Furnace Co., Holland, Mich. (Truck)
- Ideal Commutator Dresser Co., Sycamore, Ill.
- Kent Co., Inc., Rome, N. Y.
- National Super Service Co., Toledo, O.
- Premier Division, Electric Vacuum Cleaner Co., Inc., Cleveland, O.
- Ramey Mfg. Co., Columbus, O.
- Root-Connersville Blower Corp., Connersville, Ind.
- Spencer Turbine Co., Hartford, Conn.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Swift Corp., Carl E., Holland, Mich.

CLIPS, FASTENING, FOR ROOFING

- American Sheet Metal Works, New Orleans, La.
- Bridenburg Foundry Co., Philadelphia, Pa.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Milcor Steel Co., Milwaukee, Wis.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Southbridge Roofing Co., Inc., Southbridge, Mass.

CLIPS AND TIPS, DAMPER

- Adams Co., Dubuque, Ia.
- Berger Bros. Co., Philadelphia, Pa.
- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Grand Rapids Die & Tool Co., Grand Rapids, Mich.
- Griswold Mfg. Co., Erie, Pa.
- Hart & Cooley Mfg. Co., Chicago, Ill.
- Howes Co., S. M., Charlestown, Boston, Mass.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Stover Mfg. & Engine Co., Freeport, Ill.
- United States Register Co., Battle Creek, Mich.
- Young Regulator Co., Cleveland, O.

COAL BURNERS, AUTOMATIC

See Stokers ..

COLD AIR FACES, METAL

See Faces, Cold Air, Metal

COLD AIR FACES, WOOD

See Faces, Cold Air, Wood

COILS, COOLING, DIRECT EXPANSION

- Aerofin Corp., Newark, N. J.
- Airecon Industries, Detroit, Mich.
- Baker Ice Machine Co., Inc., Omaha, Nebr.
- Bush Mfg. Co., Hartford, Conn.
- Carbondale Machine Corp., Harrison, N. J.
- Carrier Corp., Newark, N. J.
- Clarage Fan Co., Kalamazoo, Mich.
- Delco-Frigidaire Conditioning Div., General Motors Sales Corp., Dayton, O.
- Fedders Mfg. Co., Buffalo, N. Y.
- Frick Co., Inc., Waynesboro, Pa.
- G & O Mfg. Co., New Haven, Conn.
- General Refrigeration Sales Co., Beloit, Wis.
- Kelvinator Corp., Detroit, Mich.
- Kauffman Air Conditioning Corp., St. Louis, Mo.
- McCord Radiator & Mfg. Co., Detroit, Mich.
- McQuay, Inc., Minneapolis, Minn.
- Marlo Coil Co., St. Louis, Mo.
- Modine Mfg. Co., Racine, Wis.
- Nash Refrigeration Co., Inc., Newark, N. J.
- Refrigeration Appliances, Inc., Chicago, Ill.
- Reliance Refrigeration Machine Co., Chicago, Ill.
- Rempe Coil Co., Chicago, Ill.
- Rome-Turney Radiator Co., Rome, N. Y.
- Servel, Inc., Evansville, Ind.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Thermal Units Mfg. Co., Chicago, Ill.
- Trane Co., La Crosse, Wis.
- Trenton Auto Radiator Wks., Trenton, N. J.
- Vilter Mfg. Co., Milwaukee, Wis.
- Westinghouse Electric & Mfg. Co., Mansfield, O.
- Whitlock Coil Pipe Co., Hartford, Conn.
- Winchester Repeating Arms Co., New Haven, Conn.
- Wing Mfg. Co., L. J., New York City
- Wittenmeyer Machinery Co., Chicago, Ill.
- XL Refrigerating Co., Inc., Chicago, Ill.
- York Ice Machinery Corp., York, Pa.
- Young Radiator Co., Racine, Wis.

COILS, COOLING, WATER

- Aerofin Corp., Newark, N. J.
- Airecon Industries, Detroit, Mich.
- American Blower Corp., Detroit, Mich.
- Baker Ice Machine Co., Inc., Omaha, Nebr.
- Bush Mfg. Co., Hartford, Conn.
- Carbondale Machine Corp., Harrison, N. J.
- Carrier Corp., Newark, N. J.
- Clarage Fan Co., Kalamazoo, Mich.
- Delco-Frigidaire Conditioning Div., General Motors Sales Corp., Dayton, O.
- Fedders Mfg. Co., Buffalo, N. Y.
- Frick Co., Inc., Waynesboro, Pa.
- G & O Mfg. Co., New Haven, Conn.
- Handelan Washed Air Co., Minneapolis, Minn.
- Kelvinator Corp., Detroit, Mich.
- McCord Radiator & Mfg. Co., Detroit, Mich.

- McQuay, Inc., Minneapolis, Minn.
- Marlo Coil Co., St. Louis, Mo.
- Modine Mfg. Co., Racine, Wis.
- Peerless Ice Machine Co., Chicago, Ill.
- Refrigeration Appliances, Inc., Chicago, Ill.
- Reliance Refrigeration Machine Co., Chicago, Ill.
- Rempe Coil Co., Chicago, Ill.
- Rome-Turney Radiator Co., Rome, N. Y.
- Star Radiator Co., Los Angeles, Cal.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Thermal Units Mfg. Co., Chicago, Ill.
- Trane Co., La Crosse, Wis.
- Trenton Auto Radiator Wks., Trenton, N. J.
- Vilter Mfg. Co., Milwaukee, Wis.
- Whitlock Coil Pipe Co., Hartford, Conn.
- XL Refrigerating Co., Inc., Chicago, Ill.
- York Ice Machinery Corp., York, Pa.
- Young Radiator Co., Racine, Wis.

COILS, FIRE POT, HOT WATER

- Air Controls, Inc., Cleveland, O.
- American Furnace & Foundry Co., Milan, Mich.
- Deshler Foundry & Machine Works, Deshler, O.
- Devlin Mfg. Co., Thos., Burlington, N. J.
- Dowagiac Steel Furnace Co., Dowagiac, Mich.
- Excelsa Products Corp., Buffalo, N. Y.
- Globe Machinery & Supply Co., Des Moines, Ia.
- Harvey-Whipple, Inc., Springfield, Mass.
- Hotstream Heater Co., Cleveland, O.
- Kitson Co., Philadelphia, Pa.
- Liberty Foundry Co., St. Louis, Mo.
- Marshall Furnace Co., Marshall, Mich.
- Melbye Bros., Inc., Chicago, Ill.
- Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Nelson Co., Detroit, Mich.
- Nugent Sons, Inc., Thos., New York City
- Rempe Coil Co., Chicago, Ill.
- Rudy Furnace Co., Dowagiac, Mich.

COILS, HEATING

- Aerofin Corp., Newark, N. J.
- Airecon Industries, Detroit, Mich.
- American Radiator Co., New York City
- Andrews Lead Co., Inc., Long Island City, N. Y.
- Baker Ice Machine Co., Inc., Omaha, Nebr.
- Bayley Blower Co., Milwaukee, Wis.
- Bishop & Babcock Sales Co., Cleveland, O.
- Bush Mfg. Co., Hartford, Conn.
- Carrier Corp., Newark, N. J.
- Clarage Fan Co., Kalamazoo, Mich.
- Delco-Frigidaire Conditioning Div., General Motors Sales Corp., Dayton, O.
- G & O Mfg. Co., New Haven, Conn.
- Kauffman Air Conditioning Corp., St. Louis, Mo.
- McQuay, Inc., Minneapolis, Minn.
- Marlo Coil Co., St. Louis, Mo.
- Modine Mfg. Co., Racine, Wis.
- Montag Stove & Furnace Works, Portland, Ore.
- Nelson Corp., Herman, Moline, Ill.
- Nesbitt, Inc., John J., Philadelphia, Pa.
- Peerless Ice Machine Co., Chicago, Ill.
- Rempe Coil Co., Chicago, Ill.
- Rome-Turney Radiator Co., Rome, N. Y.
- Star Radiator Co., Los Angeles, Cal.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Taco Heaters, Inc., New York, N. Y.
- Thermal Units Mfg. Co., Chicago, Ill.
- Trane Co., La Crosse, Wis.
- Trenton Auto Radiator Wks., Trenton, N. J.
- York Ice Machinery Corp., York, Pa.
- Young Radiator Co., Racine, Wis.

COLLECTORS, BLOW PIPE

- Airtherm Mfg. Co., St. Louis, Mo.
- American Air Filter Co., Inc., Louisville, Ky.
- Bayley Blower Co., Milwaukee, Wis.
- Blower Application Co., Milwaukee, Wis.
- Buffalo Forge Co., Buffalo, N. Y.
- Clarage Fan Co., Kalamazoo, Mich.
- Day Co., Minneapolis, Minn.
- Falstrom Co., Passaic, N. J.
- Garden City Fan Co., Chicago, Ill.
- Goethel Sheet Metal Works, Alfred, Milwaukee, Wis.
- Goethel Co., Alfred C., Milwaukee, Wis.
- Grand Rapids Blow Pipe & Dust Arrester Co., Grand Rapids, Mich.
- Kirk & Blum Mfg. Co., Cincinnati, O.
- Lee & Son Co., Thomas, Cincinnati, O.
- Mahon Co., R. C., Detroit, Mich.
- Mellish & Murray Co., Chicago, Ill.
- New York Blower Co., Chicago, Ill.
- Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.

Research Corp., New York City.
 Sly Mfg. Co., W. W., Cleveland, O.
 Sturtevant Co., B. F., Hyde Park, Boston, Mass.
 Western Blower Co., Seattle, Wash.
 Young & Bertke Co., Cincinnati, O.

COMBUSTION CONTROLS

See Controls, Combustion, Bonnet and Smoke Pipe

COMPOUNDS, CAULKING

Accurate Metal Weather Strip Co., New York City
 Acme Refining Co., Cleveland, O.
 Allmetal Weatherstrip Co., Chicago, Ill.
 American Metal Weather Strip Co., Grand Rapids, Mich.
 Asphalt Products Co., Syracuse, N. Y.
 Calbar Paint & Varnish Co., Philadelphia, Pa.
 Carey Co., Philip, Cincinnati, O.
 Clinton Metallic Paint Co., Clinton, N. Y.
 Continental Products Co., Euclid, O.
 Diamond Metal Weather Strip Co., Columbus, O.
 Eagle-Picher Lead Co., Cincinnati, O.
 Horn Co., A. C., Long Island City, N. Y.
 Iowa Paint Mfg. Co., Des Moines, Ia.
 Johns-Manville, New York City
 Lastik Products Co., Inc., Pittsburgh, Pa.
 Ohmlac Paint & Refining Co., Chicago, Ill.
 Pecora Paint Co., Philadelphia, Pa.
 Plastic Products Co., Detroit, Mich.
 ●Pyrolite Products Co., Cleveland, O.
 Sauereisen Cements Co., Sharpsburg, Pa.
 Thompson & Co., Pittsburgh, Pa.
 Wilhelm Co., A., Reading, Pa.
 Yardley Screen & Weather Strip Corp., Columbus, O.

COMPOUNDS, GLAZING

Acme Refining Co., Cleveland, O.
 Calbar Paint & Varnish Co., Philadelphia, Pa.
 Continental Products Co., Euclid, O.
 Diamond Metal Weather Strip Co., Columbus, O.
 Goodrich Co., B. F., Akron, O.
 Horn Co., A. C., Long Island City, N. Y.
 Lastik Products Co., Inc., Pittsburgh, Pa.
 Pecora Paint Co., Philadelphia, Pa.
 Plastic Products Co., Detroit, Mich.
 ●Pyrolite Products Co., Cleveland, O.
 Thompson & Co., Pittsburgh, Pa.

COMPOUNDS, TINNING

American Solder & Flux Co., Philadelphia, Pa.
 ●Burnley Battery & Mfg. Co., North East, Pa.
 Eagle-Picher Lead Co., Cincinnati, O.
 Lukens Metal Co., Thos. F., Philadelphia, Pa.
 Minn-Kota Foundry & Mfg. Co., Fargo, N. Dak.
 Potomac Mfg. Co., Philadelphia, Pa.
 ●Ruby Chemical Co., Columbus, O.

COMPOUNDS, WATER-PROOFING

Asphalt Products Co., Syracuse, N. Y.
 Barber Co., Inc., Philadelphia, Pa.
 Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
 Bird & Son, Inc., East Walpole, Mass.
 Carey Co., Philip, Cincinnati, O.
 Lastik Products Co., Inc., Pittsburgh, Pa.
 Pecora Paint Co., Philadelphia, Pa.
 Plastic Products Co., Detroit, Mich.
 Sauereisen Cements Co., Sharpsburg, Pa.
 Thompson & Co., Pittsburgh, Pa.
 Wilhelm Co., A., Reading, Pa.

COMPRESSORS, REFRIGERATING

Airtemp, Inc., Dayton, O.
 American Engineering Co., Philadelphia, Pa.
 Baker Ice Machine Co., Inc., Omaha, Nebr.
 Brunner Mfg. Co., Utica, N. Y.
 Carbondale Machine Corp., Harrison, N. J.
 Carrier Corp., Newark, N. J.
 Copeland Refrigeration Corp., Detroit, Mich.
 Curtis Refrigerating Machine Co., St. Louis, Mo.
 De La Vergne Engine Co., Philadelphia, Pa.
 Delco-Frigidaire Conditioning Div., General Motors Sales Corp., Dayton, O.
 Fairbanks, Morse & Co., Chicago, Ill.
 Frick Co., Inc., Waynesboro, Pa.
 ●General Electric Co., Schenectady, N. Y.
 General Refrigeration Sales Co., Beloit, Wis.
 Hardy Mfg. Co., Dayton, O.
 Ingersoll-Rand, New York City
 Kauffman Air Conditioning Corp., St. Louis, Mo.
 Kelvinator Corp., Detroit, Mich.

Merchant & Evans Co., Philadelphia, Pa.
 Mills Novelty Co., Chicago, Ill.
 Nash Refrigeration Co., Inc., Newark, N. J.
 Norge Commercial Div. of Borg-Warner Corp., Detroit, Mich.
 Reliance Refrigeration Machine Co., Chicago, Ill.
 Serval, Inc., Evansville, Ind.
 Uniflow Mfg. Co., Erie, Pa.
 Universal Cooler Corp., Detroit, Mich.
 Vilter Mfg. Co., Milwaukee, Wis.
 Westinghouse Electric & Mfg. Co., Mansfield, O.
 Williams Oil-O-Matic Heating Corp., Bloomington, Ill.
 Wittenmeyer Machinery Co., Chicago, Ill.
 Wolfe Engineering & Mfg. Co., Harrisburg, Pa.
 XL Refrigerating Co., Inc., Chicago, Ill.
 York Ice Machinery Corp., York, Pa.

CONDITIONERS, AIR

See Air Conditioning Units and Furnaces, Air Conditioning

CONDUCTOR FITTINGS AND ACCESSORIES

See Fittings and Accessories, Conductor

CONDUCTOR PIPE

See Pipe, Conductor

CONTROLS, COMBINED FAN AND LIMIT

●Barber-Colman Co., Rockford, Ill.
 ●Cook Electric Co., Chicago, Ill.
 ●Detroit Lubricator Co., Detroit, Mich.
 Fulton-Sylphon Co., Knoxville, Tenn.
 Edison Electrical Controls Division, Thos. A. Edison, Inc., West Orange, N. J.
 ●General Electric Co., Schenectady, N. Y.
 ●Mercoild Corp., Chicago, Ill.
 ●Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
 ●Penn Electric Switch Co., Des Moines, Ia.
 ●Perfex Controls Co., Milwaukee, Wis.
 ●Russell Electric Co., Chicago, Ill.
 Spencer Thermostat Co., Attleboro, Mass.
 Superstat Co., Springfield, Mass.
 ●White Mfg. Co., St. Paul, Minn.

CONTROLS, COMBUSTION, BONNET OR SMOKE-PIPE

●Barber-Colman Co., Rockford, Ill.
 Bristol Co., Waterbury, Conn.
 ●Cook Electric Co., Chicago, Ill.
 ●Detroit Lubricator Co., Detroit, Mich.
 Edison Electrical Controls Division, Thos. A. Edison, Inc., West Orange, N. J.
 Hays Corp., Michigan City, Ind.
 Jefferson Electric Co., Bellwood, Ill.
 ●Mercoild Corp., Chicago, Ill.
 ●Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
 ●Penn Electric Switch Co., Des Moines, Ia.
 ●Perfex Controls Co., Milwaukee, Wis.
 ●Russell Electric Co., Chicago, Ill.
 Teesdale Mfg. Co., Grand Rapids, Mich.
 United Electric Controls Co., South Boston, Mass.
 ●White Mfg. Co., St. Paul, Minn.

CONTROLS, EFFECTIVE TEMPERATURE

●Barber-Colman Co., Rockford, Ill.
 ●Friez & Sons, Inc., Julien P., Baltimore, Md.
 Johnson Service Co., Milwaukee, Wis.
 ●Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
 Powers Regulator Co., Chicago, Ill.

CONTROLS, FAN

●Automatic Products Co., Milwaukee, Wis.
 ●Barber-Colman Co., Rockford, Ill.
 ●Cook Electric Co., Chicago, Ill.
 ●Detroit Lubricator Co., Detroit, Mich.
 Edison Electrical Controls Division, Thos. A. Edison, Inc., West Orange, N. J.
 Fulton-Sylphon Co., Knoxville, Tenn.
 ●General Electric Co., Schenectady, N. Y.
 ●Gleason-Avery, Inc., Auburn, N. Y.
 Jefferson Electric Co., Bellwood, Ill.
 ●Mercoild Corp., Chicago, Ill.
 ●Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
 ●Pacific Gas Radiator Co., Los Angeles, Cal.
 Paragon Electric Co., Chicago, Ill.

- Peerless Electric Co., Warren, O.
- Penn Electric Switch Co., Des Moines, Ia.
- Perfex Controls Co., Milwaukee, Wis.
- Russell Electric Co., Chicago, Ill.
- Spencer Thermostat Co., Attleboro, Mass.
- Superstat Co., Springfield, Mass.
- United Electric Controls Co., South Boston, Mass.
- White Mfg. Co., St. Paul, Minn.

CONTROLS, HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS, PNEUMATIC

- Bristol Co., Waterbury, Conn.
- Foxboro Co., Foxboro, Mass.
- Johnson Service Co., Milwaukee, Wis.
- National Regulator Co., Chicago, Ill.
- Powers Regulator Co., Chicago, Ill.

CONTROLS, LIMIT

- Automatic Products Co., Milwaukee, Wis.
- Barber-Colman Co., Rockford, Ill.
- Cook Electric Co., Chicago, Ill.
- Detroit Lubricator Co., Detroit, Mich.
- Edison Electrical Controls Division, Thos. A. Edison, Inc., West Orange, N. J.
- General Controls Co., San Francisco, Cal., and Cleveland, O.
- Gleason-Avery, Inc., Auburn, N. Y.
- Jefferson Electric Co., Bellwood, Ill.
- McCorkle Co., D. H., Berkeley, Cal.
- Mercoild Corp., Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Penn Electric Switch Co., Des Moines, Ia.
- Perfex Controls Co., Milwaukee, Wis.
- Russell Electric Co., Chicago, Ill.
- Sheer Co., H. M., Quincy, Ill.
- Spencer Thermostat Co., Attleboro, Mass.
- United Electric Controls Co., South Boston, Mass.
- White Mfg. Co., St. Paul, Minn.

CONTROLS, OIL BURNER, COMPLETE ASSEMBLY

- Barber-Colman Co., Rockford, Ill.
- Cook Electric Co., Chicago, Ill.
- Detroit Lubricator Co., Detroit, Mich.
- General Electric Co., Schenectady, N. Y.
- McCorkle Co., D. H., Berkeley, Cal.
- Mercoild Corp., Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Penn Electric Switch Co., Des Moines, Ia.
- Perfex Controls Co., Milwaukee, Wis.
- Russell Electric Co., Chicago, Ill.

CONTROLS, STOKER, COMPLETE ASSEMBLY

- Barber-Colman Co., Rockford, Ill.
- Cook Electric Co., Chicago, Ill.
- Detroit Lubricator Co., Detroit, Mich.
- General Electric Co., Schenectady, N. Y.
- Kisco Co., Inc., St. Louis, Mo.
- Mercoild Corp., Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Paragon Electric Co., Chicago, Ill.
- Penn Electric Switch Co., Des Moines, Ia.
- Perfex Controls Co., Milwaukee, Wis.
- Russell Electric Co., Chicago, Ill.
- Spencer Thermostat Co., Attleboro, Mass.

CONTROLS, WINDOW CONDENSATION

- Friez & Sons, Inc., Julien P., Baltimore, Md.

COOLING SURFACE

See Coils, Cooling, Water

COPPER TUBING

See Tubing, Copper

COPPERS, SOLDERING

- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Bernz Co., Inc., Otto, Rochester, N. Y.
- Electric Materials Co., North East, Pa.
- Electric Soldering Iron Co., Inc., New York City
- Everhot Mfg. Co., Maywood, Ill.
- Gasweld & Airway, Inc., Chicago, Ill. (Acetylene)
- General Electric Co., Schenectady, N. Y.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Ideal Commutator Dresser Co., Sycamore, Ill.
- Minn-Kota Foundry & Mfg. Co., Fargo, N. Dak.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Sight Feed Generator Co., Richmond, Ind.
- Stanley Rule & Level Plant, New Britain, Conn.
- Turner Brass Works, Sycamore, Ill.

CORNICES

- American Sheet Metal Works, New Orleans, La.
- Berger Bros. Co., Philadelphia, Pa.
- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Biersach & Niedermeyer Co., Milwaukee, Wis.
- Brooklyn Metal Ceiling Co., Brooklyn, N. Y.
- California Cornice Works, Inc., Los Angeles, Cal.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Danzer Metal Works, Inc., Hagerstown, Md.
- Decatur Iron & Steel Co., Decatur, Ala.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Herrmann & Grace Co., Brooklyn, N. Y.
- International Steel Co., Evansville, Ind.
- La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- Lamb & Ritchie Co., Cambridge, Mass.
- Ledkote Products Co., Long Island City, N. Y.
- Martin Metal Mfg. Co., Wichita, Kan.
- Milcor Steel Co., Milwaukee, Wis.
- Miller & Doing, Inc., Brooklyn, N. Y.
- Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
- Park City Cornice Works, Inc., Bridgeport, Conn.
- Perkinson & Brown, Chicago, Ill.
- Perrin Co., Edward C., Camden, N. J.
- Providence Cornice Co., Providence, R. I.
- Ryniker Sheet Metal Works, Inc., Billings, Mont.
- St. Paul Corrugated Co., St. Paul, Minn.
- Schoedinger Co., F. O., Columbus, O.
- Southbridge Roofing Co., Inc., Southbridge, Mass.
- Van Noorden Co., E., Boston, Mass.
- Watson Co., Inc., Jas. H., Bradley, Ill.
- Willis Mfg. Co., Galesburg, Ill.
- York Corrugating Co., York, Pa.

COUPLINGS, FLEXIBLE, POWER TRANSMISSION

- Chicago Die Casting Co., Chicago, Ill.
- Congress Tool & Die Co., Detroit, Mich.
- Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.
- De Laval Steam Turbine Co., Trenton, N. J.
- Dick Co., Inc., R. & J., Passaic, N. J.
- General Blower Co., Philadelphia, Pa.
- Lovejoy Flexible Coupling Co., Chicago, Ill.
- Medart Co., St. Louis, Mo.
- Wood's Sons Co., T. B., Chambersburg, Pa.

CRACKLE FINISH PAINT

See Paint, Crackle Finish

CRIMPERS

See Tools, Metal Workers'

DAMPER MOTORS

See Motors, Damper, Furnace Draft, Electrical

DAMPERS, DUCT

- Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.
- Airecon Industries, Detroit, Mich.
- American Foundry & Furnace Co., Bloomington, Ill.
- Bishop & Babcock Sales Co., Cleveland, O.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Hampden Cornice Works, Springfield, Mass.
- Howes Co., S. M., Charlestown, Boston, Mass.
- Iona Ventilator Co., Inc., Philadelphia, Pa.
- Jacobs Co., B. & J., Cincinnati, O.
- Jamar Co., Walker, Duluth, Minn.
- Johnson Service Co., Milwaukee, Wis.
- Kirk & Blum Mfg. Co., Cincinnati, O.
- Mercoild Corp., Chicago, Ill.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Ohio Products Co., Cleveland, O.
- Phillips Heating, Ventilating & Mfg. Co., Los Angeles, Cal.
- Young Regulator Co., Cleveland, O.

DAMPERS, SMOKE PIPE

- Adams Co., Dubuque, Ia.
- Brauer Supply Co., A. G., St. Louis, Mo.
- Burt Mfg. Co., Akron, O.
- Grand Rapids Die & Tool Co., Grand Rapids, Mich.
- Griswold Mfg. Co., Erie, Pa.
- Hart & Cooley Mfg. Co., Chicago, Ill.
- Jacobs Co., B. & J., Cincinnati, O.
- Jewett Stove & Foundry Corp., Buffalo, N. Y.
- Liberty Foundry Co., St. Louis, Mo.
- Littleford Bros., Cincinnati, O.
- Martin Metal Mfg. Co., Wichita, Kan.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Perfect Burner Co., Lynn, Mass.
- Schoedinger, F. O., Co., Columbus, O.
- Stove Mfg. & Engine Co., Freeport, Ill.
- United States Register Co., Battle Creek, Mich.
- Walker Mfg. & Sales Corp., St. Joseph, Mo.
- Watson Co., Inc., Jas. H., Bradley, Ill.
- Williamson Heater Co., Cincinnati, O.

DEEP WELL PUMPS*See Pumps, Deep Well***DIES AND PRESSES***See Presses and Dies***DOORS, HOLLOW METAL**

American Sheet Metal Works, New Orleans, La.
 Bayer Co., A. J., Los Angeles, Cal.
 Biersach & Niedermeyer Co., Milwaukee, Wis.
 Edwards Mfg. Co., Inc., Cincinnati, O.
 Falstrom Co., Passaic, N. J.
 International Steel Co., Evansville, Ind.
 Metal Door & Trim Co., La Porte, Ind.
 Newman Brothers, Inc., Cincinnati, O.
 Perkinson & Brown, Chicago, Ill.
 Providence Cornice Co., Providence, R. I.
 Truscon Steel Co., Youngstown, O.

DOORS, KALAMEIN

American Sheet Metal Works, New Orleans, La.
 Biersach & Niedermeyer Co., Milwaukee, Wis.
 California Cornice Works, Inc., Los Angeles, Cal.
 Cincinnati Mfg. Co., Cincinnati, O.
 Edwards Mfg. Co., Inc., Cincinnati, O.
 Empire Door Co., Inc., New York City
 Herrmann & Grace Co., Brooklyn, N. Y.
 International Steel Co., Evansville, Ind.
 Lee & Son Co., Thomas, Cincinnati, O.
 Mahon Co., R. C., Detroit, Mich.
 Mesker & Co., Geo. L., Evansville, Ind.
 Newman Brothers, Inc., Cincinnati, O.
 Perkinson & Brown, Chicago, Ill.
 Providence Cornice Co., Providence, R. I.
 Richmond Fireproof Door Co., Syracuse, N. Y.
 Syracuse Fire Door Corp., Syracuse, N. Y.
 Van Noorden Co., E., Boston, Mass.
 World Kalamein Sash & Door Corp., New York City

DOORS AND SHUTTERS, FIRE

American Sheet Metal Works, New Orleans, La.
 Bards Range & Foundry Co., E. H., Cincinnati, O.
 Biersach & Niedermeyer Co., Milwaukee, Wis.
 Cornell Iron Works, Inc., Long Island City, N. Y.
 Detroit Steel Products Co., Detroit, Mich.
 Edwards Mfg. Co., Inc., Cincinnati, O.
 Empire Door Co., Inc., New York City.
 Falstrom Co., Passaic, N. J.
 Herrmann & Grace Co., Brooklyn, N. Y.
 International Steel Co., Evansville, Ind.
 Kinnear Mfg. Co., Columbus, O.
 Mahon Co., R. C., Detroit, Mich.
 Merchant & Evans Co., Philadelphia, Pa.
 Mesker & Co., Geo. L., Evansville, Ind.
 Perkinson & Brown, Chicago, Ill.
 Providence Cornice Co., Providence, R. I.
 Richards-Wilcox Mfg. Co., Aurora, Ill.
 Richmond Fireproof Door Co., Richmond, Ind.
 Saino Mfg. Co., Inc., F. L., Memphis, Tenn.
 St. Paul Corrugating Co., St. Paul, Minn.
 Schoedinger, F. O., Co., Columbus, O.
 Southbridge Roofing Co., Inc., Southbridge, Mass.
 Syracuse Fire Door Corp., Syracuse, N. Y.
 Van Noorden Co., E., Boston, Mass.
 Western Wire & Iron Works, Inc., Chicago, Ill.
 Wheeling Corrugating Co., Wheeling, W. Va.
 Willis Mfg. Co., Galesburg, Ill.

DRAFT GAGES*See Gages, Draft***DRAFT REGULATORS***See Regulators, Furnace Draft, Mechanical***DRILLS, ELECTRIC, PORTABLE**

Black & Decker Mfg. Co., Towson, Md.
 Clark Jr., Electric Co., Jas., Louisville, Ky.
 Excelso Products Corp., Buffalo, N. Y.
 Ideal Commutator Dresser Co., Sycamore, Ill.
 Independent Pneumatic Tool Co., Chicago, Ill.
 Power King Tool Corp., Warsaw, Ind.
 Signal Electric Mfg. Co., Menominee, Mich.
 ●Skillsaw, Inc., Chicago, Ill.
 ●Speedway Mfg. Co., Cicero, Ill.
 ●Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.
 Wodack Electric Tool Corp., Chicago, Ill.

DUCTS AND FITTINGS, PREFABRICATED

Acer & Whedon, Inc., Medina, N. Y.
 Acme Tin Plate and Roofing Supply Co., Philadelphia, Pa.
 Champion Furnace Pipe Co., Peoria, Ill.
 ●Chandler Co., Cedar Rapids, Ia.
 Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
 Corbman Bros., Inc., Philadelphia, Pa.
 Excelsior Steel Furnace Co., Chicago, Ill.
 Falstrom Co., Passaic, N. J.
 ●Henry Furnace & Foundry Co., Cleveland, O.
 ●Lamneck Products, Inc., Columbus, O.
 ●Meyer & Bro. Co., F., Peoria, Ill.
 ●Milcor Steel Co., Milwaukee, Wis.
 Moncrief Furnace Co., Atlanta, Ga.
 Reynolds Corp., New York City.

EAVES TROUGH FITTINGS AND ACCESSORIES*See Fittings and Accessories, Eaves Trough and Gutter***EAVES TROUGH AND GUTTERS**

American Sheet Metal Works, New Orleans, La.
 Ames Co., W. R., San Francisco, Cal.
 Anderson Mfg. Co., Des Moines, Ia.
 Barnes Metal Products Co., Chicago, Ill.
 ●Berger Bros. Co., Philadelphia, Pa.
 ●Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
 Braden Mfg. Co., Terre Haute, Ind.
 Bridesburg Foundry Co., Philadelphia, Pa.
 Chase Brass & Copper Co., Inc., Waterbury, Conn.
 Chicago Metal Mfg. Co., Chicago, Ill.
 Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
 Danzer Metal Works, Inc., Hagerstown, Md.
 Decatur Iron & Steel Co., Decatur, Ala.
 Downs-Smith Brass & Copper Co., Long Island City, N. Y.
 Edwards Mfg. Co., Inc., Cincinnati, O.
 ●Hussey & Co., C. G., Pittsburgh, Pa.
 Klauer Mfg. Co., Dubuque, Ia.
 La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
 Lamb & Ritchie Co., Cambridge, Mass.
 Ledkete Products Co., Long Island City, N. Y.
 Lyman Co., H. B., Southampton, Mass.
 Lyon, Conklin & Co., Inc., Baltimore, Md.
 Martin Metal Mfg. Co., Wichita, Kan.
 ●Milcor Steel Co., Milwaukee, Wis.
 Miller & Doing, Inc., Brooklyn, N. Y.
 New Delphos Mfg. Co., Delphos, O.
 Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
 ●Osborn Co., J. M. & L. A., Cleveland, O.
 Providence Cornice Co., Providence, R. I.
 Reeves Mfg. Co., Dover, O.
 Ryniker Sheet Metal Works, Inc., Billings, Mont.
 St. Paul Corrugating Co., St. Paul, Minn.
 Schoedinger, F. O., Co., Columbus, O.
 Sheet Metal Products Co., Peoria, Ill.
 Southbridge Roofing Co., Inc., Southbridge, Mass.
 Tiffin Art Metal Co., Tiffin, O.
 Van Noorden Co., E., Boston, Mass.
 Watson Co., Inc., Jas. H., Bradley, Ill.
 Wheeling Corrugating Co., Wheeling, W. Va.
 Wheeling Metal & Mfg. Co., Wheeling, W. Va.
 Willis Mfg. Co., Galesburg, Ill.
 Woolwine Metal Products Co., Los Angeles, Cal.
 York Corrugating Co., York, Pa.

EFFECTIVE TEMPERATURE CONTROLS*See Controls, Effective Temperature***ELBOW MACHINES***See Machines, Elbow***ELBOWS, BLOW PIPE***See Fittings, Blow Pipe***ELBOWS, CONDUCTOR***See Fittings and Accessories, Conductor***ELBOWS, FURNACE PIPE***See Fittings and Accessories, Furnace Pipe***ELECTRIC DRILLS***See Drills, Electric, Portable***ELECTRIC SHEARS***See Shears, Portable, Electric***ELECTRIC WELDERS***See Welders, Arc, Spot***ELECTRICAL RELAYS***See Relays, Electrical*

ELECTRODES, ARC WELDING

- Air Reduction Sales Co., New York City
- Allegheny Steel Co., Brackenridge, Pa.
- American Brass Co., Waterbury, Conn.
- American Chain Co., Inc., Bridgeport, Conn.
- American Steel & Wire Co., Chicago, Ill.
- Central Steel & Wire Co., Chicago, Ill.
- Chicago Steel & Wire Co., Chicago, Ill.
- Crucible Steel Co. of America, New York City.
- General Electric Co., Schenectady, N. Y.
- Hollup Corp., Chicago, Ill.
- Imperial Brass Mfg. Co., Chicago, Ill.
- Keasbey & Mattison Co., Ambler, Pa.
- Lee & Son Co., K. O., Aberdeen, S. D.
- Lincoln Electric Co., Cleveland, O.
- Maurath, Inc., Cleveland, O.
- Roebbing's Sons Co., John A., Trenton, N. J.
- Ryerson & Son, Inc., Jos. T., Chicago, Ill.
- Sight Feed Generator Co., Richmond, Ind.
- Torchweld Equipment Co., Chicago, Ill.
- Universal Power Corp., Cleveland, O.
- Westinghouse Electric & Mfg. Co., Mansfield, O.
- Wilson Welder & Metals Co., Inc., North Bergen, N. J.

FACES, COLD AIR, METAL

- American Foundry & Furnace Co., Bloomington, Ill.
- Auer Register Co., Cleveland, O.
- Best Register Co., Milwaukee, Wis.
- Diamond Mfg. Co., Wyoming, Pa.
- Forest City Foundries Co., Cleveland, O.
- Gillian Mfg. Co., Detroit, Mich.
- Hart & Cooley Mfg. Co., Chicago, Ill.
- Hendrick Mfg. Co., Carbondale, Pa.
- Independent Register Co., Cleveland, O.
- Keith Furnace Co., Des Moines, Ia. (Cast)
- Lamneck Products, Inc., Columbus, O.
- Liberty Foundry Co., St. Louis, Mo.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
- Roberts-Hamilton Co., Minneapolis, Minn.
- Rock Island Register Co., Rock Island, Ill.
- Tuttle & Bailey, Inc., New Britain, Conn.
- United States Register Co., Battle Creek, Mich.
- Waterloo Register Co., Waterloo, Ia.
- Williamson Heater Co., Cincinnati, O.

FACES, COLD AIR, WOOD

- American Wood Register Co., Plymouth, Ind.
- Antigo Building Supply Co., Antigo, Wis.
- Best Register Co., Milwaukee, Wis.
- Eaglesfield Ventilator Co., Indianapolis, Ind.
- Garber Lumber & Construction Co., Strasburg, O.
- Marsh Lumber Co., Dover, O.
- McClure Builders' Supply Co., East Palestine, O.
- Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
- Rock Island Register Co., Rock Island, Ill.
- Tiffin Art Metal Co., Tiffin, O.
- United States Register Co., Battle Creek, Mich.
- Wooster Art Wood, Inc., Wooster, O.

FANS, BOOSTER, COLD AIR RETURN

- A-C Mfg. Co., Pontiac, Ill.
- Advance Aluminum Castings Corp., Chicago, Ill.
- Aerovent Fan Co., Piqua, O.
- American Blower Corp., Detroit, Mich.
- Autovent Fan Co., Piqua, O.
- Autovent Fan & Blower Co., Chicago, Ill.
- Brumme Mfg. Co., Chicago, Ill.
- Buffalo Forge Co., Buffalo, N. Y.
- Cary Mfg. Co., Waupaca, Wis.
- Champion Blower & Forge Co., Lancaster, Pa.
- De Bothezat Corp., Div. American Machine & Metals, Inc., New York City.
- Electrogas Furnace & Mfg. Co., San Francisco, Cal.
- Electrovent Fan & Mfg. Co., Chicago, Ill.
- Emerson Electric Mfg. Co., St. Louis, Mo.
- Foret-Air Co., Rockford, Ill.
- General Regulator Corp., Chicago, Ill.
- International Engineering, Inc., Dayton, O.
- Peerless Electric Co., Warren, O.
- Roan Mfg. Co., Racine, Wis.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Universal Blower Co., Birmingham, Mich.
- Western Blower Co., Seattle, Wash.

FANS, BOOSTER, ONE-PIPE WARM AIR

- American Foundry & Furnace Co., Bloomington, Ill.
- Brumme Mfg. Co., Chicago, Ill.
- Champion Blower & Forge Co., Lancaster, Pa.
- Meier Electric & Machine Co., Indianapolis, Ind.
- Victor Electric Products, Inc., Cincinnati, O.

FANS, FURNACE, PROPELLER TYPE

- Advance Aluminum Castings Corp., Chicago, Ill.
- Aerovent Fan Co., Piqua, O.
- Air Controls, Inc., Cleveland, O.

- American Coolair Corp., Jacksonville, Fla.
- American Foundry & Furnace Co., Bloomington, Ill.
- Arex Co., Chicago, Ill.
- Autovent Fan & Blower Co., Chicago, Ill.
- Buffalo Forge Co., Buffalo, N. Y.
- Campbell Heating Co., Des Moines, Ia.
- Campbell Heating Co., E. K., Kansas City, Mo.
- Champion Blower & Forge Co., Lancaster, Pa.
- Chicago Steel Furnace Co., Chicago, Ill.
- Columbus Heating & Ventilating Co., Columbus, O.
- De Bothezat Corp., Div. American Machine & Metals, Inc., New York City.
- Economy Electric Mfg. Co., Cicero, Ill.
- Electrovent Fan & Mfg. Co., Chicago, Ill.
- Emerson Electric Mfg. Co., St. Louis, Mo.
- Foret-Air Co., Rockford, Ill.
- Fraser Furnace Co., Inc., Stockton, Cal.
- Garden City Fan Co., Chicago, Ill.
- General Blower Co., Philadelphia, Pa.
- General Regulator Corp., Chicago, Ill.
- Haynes Furnace Fan Co., Kansas City, Mo.
- Henry Furnace & Foundry Co., Cleveland, O.
- Home Furnace Co., Holland, Mich.
- International Engineering, Inc., Dayton, O.
- Johnston Co., Wm. W., Dayton, O.
- Lennox Furnace Co., Marshalltown, Ia.
- McPherson Furnace & Supply Co., Portland, Ore.
- Majestic Co., Huntington, Ind.
- Meier Electric & Machine Co., Indianapolis, Ind.
- Mohr-Air Co., Marion, O.
- New York Blower Co., Chicago, Ill.
- Peerless Electric Co., Warren, O.
- Propellair, Inc., Springfield, O.
- Reed Unit-Fans, Inc., New Orleans, La.
- Russell Electric Co., Chicago, Ill.
- Schwitzer-Cummins Co., Indianapolis, Ind.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Universal Blower Co., Birmingham, Mich.
- Utility Fan & Mfg. Co., Los Angeles, Cal.
- Victor Electric Products, Inc., Cincinnati, O.
- Western Blower Co., Seattle, Wash.
- Wing Mfg. Co., L. J., New York City.

FANS, KITCHEN EXHAUST

- Aerovent Fan Co., Piqua, O.
- Airmaster Corp., Chicago, Ill.
- Allen Corp., Detroit, Mich.
- American Blower Corp., Detroit, Mich.
- American Coolair Corp., Jacksonville, Fla.
- Arex Co., Chicago, Ill.
- Autovent Fan & Blower Co., Chicago, Ill.
- Barrett Engineers, Cleveland Heights, O.
- Bishop & Babcock Sales Co., Cleveland, O.
- Buffalo Forge Co., Buffalo, N. Y.
- Champion Blower & Forge Co., Lancaster, Pa.
- Clarage Fan Co., Kalamazoo, Mich.
- De Bothezat Corp., Div. American Machine & Metals, Inc., New York City.
- Diehl Mfg. Co., Elizabethport, N. J.
- Electrovent Corp., Detroit, Mich.
- Electrovent Fan & Mfg. Co., Chicago, Ill.
- Economy Electric Mfg. Co., Cicero, Ill.
- Emerson Electric Mfg. Co., St. Louis, Mo.
- Foret-Air Co., Rockford, Ill.
- Garden City Fan Co., Chicago, Ill.
- General Blower Co., Philadelphia, Pa.
- General Electric Co., Schenectady, N. Y.
- General Regulator Corp., Chicago, Ill.
- Hirschman Co., Inc., W. F., Buffalo, N. Y.
- International Engineering, Inc., Dayton, O.
- Jordan & Co., Paul R., Indianapolis, Ind.
- King Ventilating Co., Owatonna, Minn.
- Meier Electric & Machine Co., Indianapolis, Ind.
- Midwest Ventilating Works, Milwaukee, Wis.
- Myers Electric Co., Pittsburgh, Pa.
- Nelson Corp., Herman, Moline, Ill.
- New York Blower Co., Chicago, Ill.
- Peerless Electric Co., Warren, O.
- Propellair, Inc., Springfield, O.
- Pryne & Co., Inc., Los Angeles, Cal.
- Reed Unit-Fans, Inc., New Orleans, La.
- Robbins & Myers, Inc., Springfield, O.
- Signal Electric Mfg. Co., Menominee, Mich.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Universal Blower Co., Birmingham, Mich.
- Victor Electric Products, Inc., Cincinnati, O.
- Wagner Electric Corp., St. Louis, Mo.
- Ward Mfg. Co., Detroit, Mich.
- Western Blower Co., Seattle, Wash.
- Westinghouse Electric & Mfg. Co., Mansfield, O.
- Utility Fan & Mfg. Co., Los Angeles, Cal.

FANS, NIGHT AIR COOLING, COMPLETE UNIT

- Air Controls Inc., Cleveland, O.
- Airmaster Corp., Chicago, Ill.
- American Blower Corp., Detroit, Mich.
- American Coolair Corp., Jacksonville, Fla.
- Autovent Fan & Blower Co., Chicago, Ill.
- Bishop & Babcock Sales Co., Cleveland, O.

- Buffalo Forge Co., Buffalo, N. Y.
- Champion Blower & Forge Co., Lancaster, Pa.
- Delco-Frigidaire Conditioning Div., General Motors Sales Corp., Dayton, O.
- Electrovent Fan & Mfg. Co., Chicago, Ill.
- General Blower Co., Philadelphia, Pa.
- General Regulator Corp., Chicago, Ill.
- Hirschman Co., Inc., W. F., Buffalo, N. Y.
- International Engineering, Inc., Dayton, O.
- Iona Ventilator Co., Inc., Philadelphia, Pa.
- Johnson Fan & Blower Corp., Chicago, Ill.
- King Ventilating Co., Owatonna, Minn.
- Kisco Company, Inc., St. Louis, Mo.
- Lau Blower Co., Dayton, O.
- Marathon Electric Mfg. Corp., Wausau, Wis.
- Meier Electric & Machine Co., Indianapolis, Ind.
- Mellish & Murray Co., Chicago, Ill.
- New York Blower Co., Chicago, Ill.
- Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.
- Peerless Electric Co., Warren, O.
- Propellair, Inc., Springfield, O.
- Robbins & Myers, Inc., Springfield, O.
- Russell Electric Co., Chicago, Ill.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Universal Blower Co., Birmingham, Mich.
- Victor Electric Products, Inc., Cincinnati, O.
- Viking Air Conditioning Corp., Cleveland, O.

FANS, VENTILATING, PROPELLER TYPE

(Capacity 4,000 c.f.m. up)

- Advance Aluminum Costing Corp., Chicago, Ill.
- Aerovent Fan Co., Piqua, O.
- Air Controls, Inc., Cleveland, O.
- Air Devices Corp., Chicago, Ill.
- Airecon Industries, Detroit, Mich.
- Airmaster Corp., Chicago, Ill.
- Allen Corp., Detroit, Mich.
- American Blower Corp., Detroit, Mich.
- American Coolair Corp., Jacksonville, Fla.
- Ames Co., W. R., San Francisco, Cal.
- Arex Co., Chicago, Ill.
- Autovent Fan & Blower Co., Chicago, Ill.
- Bayley Blower Co., Milwaukee, Wis.
- Bishop & Babcock Sales Co., Cleveland, O.
- Buffalo Forge Co., Buffalo, N. Y.
- Burt Mfg. Co., Akron, O.
- Campbell Heating Co., E. K., Kansas City, Mo.
- Champion Blower & Forge Co., Lancaster, Pa.
- Clarage Fan Co., Kalamazoo, Mich.
- Clay Equipment Corp., Cedar Falls, Ia.
- Columbus Heating & Ventilating Co., Columbus, O.
- Coppus Engineering Corp., Worcester, Mass.
- De Bothezat Corp., Div. American Machine & Metals, Inc., New York City
- Diehl Mfg. Co., Elizabethport, N. J.
- Economy Electric Mfg. Co., Cicero, Ill.
- Electrovent Fan & Mfg. Co., Chicago, Ill.
- Emerson Electric Mfg. Co., St. Louis, Mo.
- Evry-Use Products, Inc., New York City.
- Foret-Air Co., Rockford, Ill.
- Fresh'nd-Aire Co., Chicago, Ill.
- Garden City Fan Co., Chicago, Ill.
- General Blower Co., Philadelphia, Pa.
- General Regulator Corp., Chicago, Ill.
- Grand Rapids Blow Pipe and Dust Arrester Co., Grand Rapids, Mich.
- Hartzell Propeller Fan Co., Piqua, O.
- Hirschman Co., Inc., W. F., Buffalo, N. Y.
- Holtum Mfg. Co., Freeport, Ill.
- Hudson Equipment Corp., Minneapolis, Minn.
- Ilg Electric Ventilating Co., Chicago, Ill.
- International Engineering, Inc., Dayton, O.
- Johnson Fan & Blower Corp., Chicago, Ill.
- Johnston & Co., Wm. W., Dayton, O.
- Jordan & Co., Paul R., Indianapolis, Ind.
- King Ventilating Co., Owatonna, Minn.
- Kisco Company, Inc., St. Louis, Mo.
- Lau Blower Co., Dayton, O.
- MaGirl Foundry & Furnace Works, P. H. Bloomington, Ill.
- Marathon Electric Mfg. Corp., Wausau, Wis.
- Meier Electric & Machine Co., Indianapolis, Ind.
- Myers Electric Co., Pittsburgh, Pa.
- National Fan & Blower Corp., Chicago, Ill.
- Nelson Corp., Herman, Moline, Ill.
- New York Blower Co., Chicago, Ill.
- Peerless Electric Co., Warren, O.
- Perkins & Son, Inc., B. F., Holyoke, Mass.
- Propellair, Inc., Springfield, O.
- Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
- Reed Unit-Fans, Inc., New Orleans, La.
- Russell Electric Co., Chicago, Ill.
- Schwitzer-Cummins Co., Indianapolis, Ind.
- Signal Electric Mfg. Co., Menominee, Mich.
- Star Electric Motor Co., Bloomfield, N. J.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Thermal Units Mfg. Co., Chicago, Ill.
- Utility Fan & Mfg. Co., Los Angeles, Cal.

- Victor Electric Products, Inc., Cincinnati, O.
- Viking Air Conditioning Corp., Cleveland, O.
- Western Blower Co., Seattle, Wash.
- Western Rotary Ventilator Co., Inc., Los Angeles, Cal.
- Wing Mfg. Co., L. J., New York City.

FAN (PROPELLER)—FILTER UNITS

- Air Controls, Inc., Cleveland, O.
- Champion Blower & Forge Co., Lancaster, Pa.
- Chicago Steel Furnace Co., Chicago, Ill.
- Foret-Air Co., Rockford, Ill.
- Henry Furnace & Foundry Co., Cleveland, O.
- International Engineering, Inc., Dayton, O.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Propellair, Inc., Springfield, O.
- Russell Electric Co., Chicago, Ill.

FILTERS, AIR

- Air-Maze Corp., Cleveland, O.
- American Air Filter Co., Inc., Louisville, Ky.
- American Radiator Co., New York City.
- Amirton Co., New York City.
- Annis, Emmett F., Glendale, Cal.
- Anson Industrial Co., New York City.
- Burt Air Filter Corp., New York City.
- Consolidated Air Conditioning Corp., New York City. (Odor Adsorbers.)
- Coppus Engineering Corp., Worcester, Mass.
- Davies Air Filter Corp., New York City.
- Felters Co., Inc., Boston, Mass.
- Gehri Co., Tacoma, Wash.
- Hugo Mfg. Co., Duluth, Minn.
- Independent Air Filter Co., Inc., Chicago, Ill.
- Kauffman Air Conditioning Corp., St. Louis, Mo.
- Kleenaire Corp., Stevens Point, Wis.
- Owens-Illinois Glass Co., Toledo, O.
- Plymouth Cordage Co., North Plymouth, Mass.
- Ripley Co., W. R., Tacoma, Wash.
- Russell Electric Co., Chicago, Ill.
- Somers, Inc., H. J., Detroit, Mich.
- Stayhew Filter Corp., Rochester, N. Y.
- Tuttle Air Filter Co., Inc., Louisville, Ky.
- Wilson & Co., Inc., Chicago, Ill.

FIRE BRICK

See Refractories

FITTINGS AND ACCESSORIES, CONDUCTOR

(Elbows, Heads, Hooks, Shoes, Straps, etc.)

- Barnes Metal Products Co., Chicago, Ill.
- Berger Bros. Co., Philadelphia, Pa.
- Berger Co., L. D., Philadelphia, Pa.
- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Braden Mfg. Co., Terre Haute, Ind.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Crary Mfg. Co., Middleport, O. (Cut-off.)
- Danzer Metal Works, Inc., Hagerstown, Md.
- Dieckmann Co., Ferdinand, Cincinnati, O.
- Downs-Smith Brass & Copper Co., Long Island City, N. Y.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Iwan Bros., South Bend, Ind.
- Jelliff Mfg. Corp., C. O., Southport, Conn.
- Klauer Mfg. Co., Dubuque, Ia.
- La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- Lamb & Ritchie Co., Cambridge, Mass.
- Levow, David, New York City.
- Lyon, Conklin & Co., Inc., Baltimore, Md.
- Martin Metal Mfg. Co., Wichita, Kan.
- Milcor Steel Co., Milwaukee, Wis.
- Miller & Doing, Inc., Brooklyn, N. Y.
- New Delphos Mfg. Co., Delphos, O.
- Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Perrin Co., Edward C., Camden, N. J.
- Providence Cornice Co., Providence, R. I.
- Royal Metal Products Co., Brooklyn, N. Y.
- St. Paul Corrugating Co., St. Paul, Minn.
- Schoedinger Co., F. O., Columbus, O.
- Sheet Metal Products Co., Peoria, Ill.
- Stewart Foundry, O. S., Cleveland, O.
- Tiffin Art Metal Co., Tiffin, O.
- Watson Co., Inc., Jas. H., Bradley, Ill.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Metal & Mfg. Co., Wheeling, W. Va.
- Willis Mfg. Co., Galesburg, Ill.
- Woolwine Metal Products Co., Los Angeles, Cal.

FITTINGS AND ACCESSORIES, EAVES TROUGH AND GUTTER

(Hangers, Strainers, Miters, Ends, Thimbles, etc.)

- Abbott Mfg. Co., Painesville, O. (Hangers)

- Barnes Metal Products Co., Chicago, Ill.
- Berger Bros. Co., Philadelphia, Pa.
- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Braden Mfg. Co., Terre Haute, Ind.
- California Cornice Works, Inc., Los Angeles, Cal.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Danzer Metal Works, Inc., Hagerstown, Md.
- Downs-Smith Brass & Copper Co., Long Island City, N. Y.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Grand Rapids Wire Products Co., Grand Rapids, Mich.
- Hussey & Co., C. G., Pittsburgh, Pa. (Copper)
- Iwan Brothers, South Bend, Ind.
- Klauer Mfg. Co., Dubuque, Ia.
- La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- Lamb & Ritchie Co., Cambridge, Mass.
- Ledkote Products Co., Long Island City, N. Y.
- Levow, David, New York City.
- Lyman Co., H. B., Southampton, Mass.
- Lyon, Conklin & Co., Inc., Baltimore, Md.
- Martin Metal Mfg. Co., Wichita, Kan.
- Milcor Steel Co., Milwaukee, Wis.
- New Delphos Mfg. Co., Delphos, O.
- Ohio Wire Products Co., Dover, O. (Hangers)
- Osborn Co., J. M. & L. A., Cleveland, O.
- Providence Cornice Co., Providence, R. I.
- Reeves Mfg. Co., Dover, O.
- St. Paul Corrugating Co., St. Paul, Minn.
- Sheet Metal Products Co., Peoria, Ill.
- Southbridge Roofing Co., Inc., Southbridge, Mass.
- Tiffin Art Metal Co., Tiffin, O.
- Waddell, Bruce, Indianapolis, Ind.
- Watson Co., Inc., Jas. H., Bradley, Ill.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Metal & Mfg. Co., Wheeling, W. Va.
- Willis Mfg. Co., Galesburg, Ill.
- Woolwine Metal Products Co., Los Angeles, Cal.

FITTINGS AND ACCESSORIES, FURNACE PIPE

(Angles, Boots, Elbows, Heads, Joints, Offsets, Tees, etc.)

- Acer & Whedon, Inc., Medina, N. Y.
- Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.
- Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.
- Bergstrom Mfg. Corp., Neenah, Wis.
- Braden Mfg. Co., Terre Haute, Ind.
- Campbell Heating Co., Des Moines, Ia.
- Cary Mfg. Co., Waupaca, Wis.
- Champion Furnace Pipe Co., Peoria, Ill.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Cincinnati Stamping Co., Cincinnati, O.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Farquhar Furnace Co., Wilmington, O.
- Henry Furnace & Foundry Co., Cleveland, O.
- Holland Furnace Co., Holland, Mich.
- Home Furnace Co., Holland, Mich.
- Howe & Bassett Co., Inc., Rochester, N. Y. (Boots)
- Howes Co., S. M., Charlestown, Boston, Mass.
- International Heater Co., Utica, N. Y.
- Kalamazoo Stove Co., Kalamazoo, Mich.
- La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- (Elbows and pipe only)
- Lamneck Products, Inc., Columbus, O.
- Lyman Co., H. B., Southampton, Mass.
- Majestic Co., Huntington, Ind.
- Marshall Furnace Co., Marshall, Mich.
- Martin Bros., Rochester, N. Y.
- Martin Metal Mfg. Co., Wichita, Kan.
- Meyer & Bro. Co., F., Peoria, Ill.
- Milcor Steel Co., Milwaukee, Wis.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Norman Sheet Metal Mfg. Co., Nevada, Mo.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Parkersburg Iron & Steel Co., Parkersburg, W. Va.
- Payne Furnace & Supply Co., Beverly Hills, Cal.
- Peerless Foundry Co., Indianapolis, Ind.
- Providence Cornice Co., Providence, R. I.
- Reeves Mfg. Co., Dover, O.
- Roberts-Hamilton Co., Minneapolis, Minn.
- Rock Island Register Co., Rock Island, Ill.
- Sterling Foundry Co., Sterling, Ill. (Cast Iron)
- Stratton & Terstegge Co., Louisville, Ky.
- Tiffin Art Metal Co., Tiffin, O.
- Tuttle & Bailey, Inc., New Britain, Conn. (Turning blades)
- United States Register Co., Battle Creek, Mich.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Williamson Heater Co., Cincinnati, O.

FITTINGS AND ACCESSORIES, SMOKE PIPE

(Draw-bands, Clean-outs, Collars, Tees, etc.)

- Acer & Whedon, Inc., Medina, N. Y.
- Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.
- Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.
- Bardes Range & Foundry Co., E. H., Cincinnati, O.
- Berger Co., L. D., Philadelphia, Pa.
- Bergstrom Mfg. Corp., Neenah, Wis.

- Braden Mfg. Co., Terre Haute, Ind.
- Brauer Supply Co., A. G., St. Louis, Mo.
- Cary Mfg. Co., Waupaca, Wis.
- Champion Furnace Pipe Co., Peoria, Ill.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Cincinnati Stamping Co., Cincinnati, O.
- Danzer Metal Works, Inc., Hagerstown, Md.
- Detroit Safety Furnace Pipe Co., Detroit, Mich.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Harold Furnace Mfg. Co., Spokane, Wash.
- Hart & Cooley Mfg. Co., Chicago, Ill. (Lugs)
- Henry Furnace & Foundry Co., Cleveland, O.
- Home Furnace Co., Holland, Mich.
- Howes Co., S. M., Charlestown, Boston, Mass.
- International Heater Co., Utica, N. Y.
- La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- Lamneck Products, Inc., Columbus, O.
- Lyman Co., H. B., Southampton, Mass.
- Majestic Co., Huntington, Ind.
- Maple City Furnace Co., Monmouth, Ill.
- Marshall Furnace Co., Marshall, Mich.
- Martin Metal Mfg. Co., Wichita, Kan.
- Meyer & Bro. Co., F., Peoria, Ill.
- Milcor Steel Co., Milwaukee, Wis.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Patten Co., J. V., Sycamore, Ill.
- Peerless Foundry Co., Indianapolis, Ind.
- Providence Cornice Co., Providence, R. I.
- Reeves Mfg. Co., Dover, O.
- Roberts-Hamilton Co., Minneapolis, Minn.
- Rock Island Register Co., Rock Island, Ill.
- Schoedinger, F. O., Columbus, O.
- Standard Furnace & Supply Co., Omaha, Nebr.
- Stratton & Terstegge Co., Louisville, Ky.
- Tierney Rotor Ventilator Co., Minneapolis, Minn.
- Tiffin Art Metal Co., Tiffin, O.
- United States Register Co., Battle Creek, Mich.
- Watson Co., Inc., Jas. H., Bradley, Ill.
- Williamson Heater Co., Cincinnati, O.
- Wise Furnace Co., Akron, O.

FITTINGS AND ACCESSORIES, STOVE PIPE

(Draw-bands, Collars, Tees, etc.)

- Acer & Whedon, Inc., Medina, N. Y.
- Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.
- Bardes Range & Foundry Co., E. H., Cincinnati, O.
- Berger Co., L. D., Philadelphia, Pa.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Howes Co., S. M., Charlestown, Boston, Mass.
- Milcor Steel Co., Milwaukee, Wis.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Parkersburg Iron & Steel Co., Parkersburg, W. Va.
- Peerless Foundry Co., Indianapolis, Ind.
- Providence Cornice Co., Providence, R. I.
- Reeves Mfg. Co., Dover, O.
- Roberts-Hamilton Co., Minneapolis, Minn.
- Schoedinger, F. O., Columbus, O.
- Stratton & Terstegge Co., Louisville, Ky.
- United States Register Co., Battle Creek, Mich.
- Walker Mfg. & Sales Corp., St. Joseph, Mo. (Tees).
- Wheeling Corrugating Co., Wheeling, W. Va.

FITTINGS, BLOW PIPE

(Elbows, Flanges, Hangers, Hoods and Sweeps, Joints, Rings, Tubing)

- Acer & Whedon, Inc., Medina, N. Y.
- Airtherm Mfg. Co., St. Louis, Mo.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Danzer Metal Works, Inc., Hagerstown, Md.
- Day Co., Minneapolis, Minn.
- Falstrom Co., Passaic, N. J.
- Goethel Sheet Metal Works, Alfred, Milwaukee, Wis.
- Goethel Co., Alfred C., Milwaukee, Wis.
- Grand Rapids Blow Pipe & Dust Arrester Co., Grand Rapids, Mich.
- Kirk & Blum Mfg. Co., Cincinnati, O.
- Lee & Son Co., Thomas, Cincinnati, O.
- Mahon Co., R. C., Detroit, Mich.
- Meyer & Bro. Co., F., Peoria, Ill.
- Providence Cornice Co., Providence, R. I.
- Western Blower Co., Seattle, Wash.
- Young & Bertke Co., Cincinnati, O.

FITTINGS, HUMIDIFIER, WATER LINE

- American Brass Co., Waterbury, Conn.
- Bishop Humidifier Co., Detroit, Mich.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Fisher Governor Co., Marshalltown, Ia.
- Hays Mfg. Co., Erie, Pa.
- Holland Furnace Co., Holland, Mich.

- Humidity Headquarters, Cleveland, O.
 Kleenaire Corp., Stevens Point, Wis.
 ●Mald-O'-Mist, Inc., Chicago, Ill.
 ●Monmouth Products Co., Cleveland, O.
 Reichert Float & Mfg. Co., Toledo, O.
 Sallada Mfg. Co., Minneapolis, Minn.
 Scovill Mfg. Co., Morency-Van Bureau Div., Sturgis, Mich.
 ●Skuttle Co., J. L., Detroit, Mich.
 Streamline Pipe & Fittings Div., Mueller Brass Co., Port Huron, Mich.
 Turney Corp., Muskegon, Mich.
 Weatherhead Co., Cleveland, O.

FLANGES, BLOW PIPE

See Fittings, Blow Pipe

FLASHINGS, ROOF, PATENTED

- Barrett Co., New York City.
 Bridesburg Foundry Co., Philadelphia, Pa.
 Chase Brass & Copper Co., Inc., Waterbury, Conn.
 Chicago Metal Mfg. Co., Chicago, Ill.
 Downs-Smith Brass & Copper Co., Long Island City, N. Y.
 Eagle-Picher Lead Co., Cincinnati, O.
 Edwards Mfg. Co., Inc., Cincinnati, O.
 Figge Co., Chicago, Ill.
 ●Hussey & Co., C. G., Pittsburgh, Pa.
 Lamb & Ritchie Co., Cambridge, Mass.
 Ledkote Products Co., Long Island City, N. Y.
 ●Milcor Steel Co., Milwaukee, Wis.
 New Delphos Mfg. Co., Delphos, O.
 Norman Sheet Metal Mfg. Co., W. F. Nevada, Mo.
 Providence Cornice Co., Providence, R. I.
 ●Revere Copper & Brass, Inc., New York City.
 Robertson Co., H. H., Pittsburgh, Pa.
 Rochester Lead Works, Inc., Rochester, N. Y.
 Schoedinger, F. O., Columbus, O.
 Van Noorden Co., E., Boston, Mass.
 Willis Mfg. Co., Galesburg, Ill. (Copper).
 York Corrugating Co., York, Pa.

FLASHINGS, THROUGH-WALL, PATENTED

- American Brass Co., Waterbury, Conn. (Copper).
 Chase Brass & Copper Co., Inc., Waterbury, Conn.
 Cheney Co., Philadelphia, Pa. (Copper).
 Fingles, Inc., W. A. Baltimore, Md.
 ●Revere Copper & Brass Inc., New York City. (Copper).
 Robertson Co., H. H., Pittsburgh, Pa.
 Willis Mfg. Co., Galesburg, Ill. (Galvanized & copper).

FLASHINGS, WALL, PATENTED

- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
 Cheney Co., Philadelphia, Pa.
 Fingles, Inc., W. A., Baltimore, Md.
 La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
 ●Milcor Steel Co., Milwaukee, Wis.
 New Delphos Mfg. Co., Delphos, O.
 Norman Sheet Metal Mfg. Co., W. F. Nevada, Mo.
 Providence Cornice Co., Providence, R. I.
 ●Revere Copper & Brass, Inc., New York City.
 St. Paul Corrugating Co., St. Paul, Minn.
 Schoedinger, F. O., Co., Columbus, O.
 Willis Mfg. Co., Galesburg, Ill.
 York Corrugating Co., York, Pa.

FLUE GAS ANALYZERS

See Analyzers, Flue Gas

FLUX, SOLDERING

- Alumaweld Co. of America, Chicago, Ill.
 American Chemical Paint Co., Ambler, Pa.
 American Solder & Flux Co., Philadelphia, Pa.
 Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
 ●Benson Co., Inc., Alex. R., Hudson, N. Y. (Salts, Pastes).
 ●Burnley Battery & Mfg. Co., North East, Pa. (Paste, Salts, Solution).
 Diener Mfg. Co., Geo. W., Chicago, Ill.
 Gardiner Metal Co., Chicago, Ill.
 ●General Electric Co., Schenectady, N. Y.
 Handy & Harmon, New York City.
 Imperial Brass Mfg. Co., Chicago, Ill.
 Kester Solder Co., Chicago, Ill.
 Ke-Ti Products Co., Columbus, O.
 Lukens Metal Co., Thos. F., Philadelphia, Pa.
 Milburn Co., Alexander, Baltimore, Md.
 Pfanstiehl Chemical Co., Waukegan, Ill.
 Potomac Mfg. Co., Philadelphia, Pa.
 ●Ruby Chemical Co., Columbus, O. (Liquid and Paste).
 Sight Feed Generator Co., Richmond, Ind.
 Torchweld Equipment Co., Chicago, Ill.

FORCED DRAFT BLOWERS

See Blowers, Forced Draft

FURNACE BLOWERS

See Blowers, Furnace, Centrifugal

FURNACE-BURNER UNITS

See Furnaces, Air Conditioning, and Furnaces, Warm Air, Gravity

FURNACE CEMENT

See Cement, Furnace

FURNACE CHAIN

See Chain, Furnace

FURNACE COVERING

See Insulation, Furnace and Pipe

FURNACE FANS

See Fans, Furnace, Propeller Type

FURNACE FILTERS

See Filters, Air

FURNACE HUMIDIFIERS

See Humidifiers, Furnace, Evaporation and Spray

FURNACE INSULATION

See Insulation, Furnace and Pipe

FURNACE LINING

See Refractories

FURNACE PIPE

See Pipe, Furnace

FURNACE PIPE FITTINGS AND ACCESSORIES

See Fittings and Accessories, Furnace Pipe

FURNACE PULLEYS

See Pulleys, Furnace

FURNACE REGULATORS

See Regulators, Furnace Draft, Mechanical and Motors, Damper, Furnace Draft, Electrical

FURNACE REPAIRS

See Repairs, Stove and Furnace

FURNACE VACUUM CLEANERS

See Cleaners, Vacuum, Furnace

FURNACES, AIR CONDITIONING, COAL BURNING

(Matched furnace-fan-filter-humidifier unit)

- American Foundry & Furnace Co., Bloomington, Ill.
 American Furnace Co., St. Louis, Mo.
 Arcweld Mfg. Co., Inc., Seattle, Wash.
 Armstrong Furnace Co., Columbus, O.
 Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.
 Baker Furnace & Cleaner Mfg. Co., Toledo, O.
 Brown Sheet Iron & Steel Co., St. Paul, Minn.
 Bryant Heater Co., Cleveland, O.
 Campbell Heating Co., Des Moines, Ia.
 Campbell Heating Co., E. K., Kansas City, Mo.
 ●Chandler Co., Cedar Rapids, Ia.
 Columbus Heating & Ventilating Co., Columbus, O.
 ●Dall Steel Products Co., Lansing, Mich.
 Dowagiac Steel Furnace Co., Dowagiac, Mich.
 Edwards Furnace Co., Wellsboro, Pa.
 Enterprise Boiler & Tank Works, Inc., Chicago, Ill.
 Excelsior Steel Furnace Co., Chicago, Ill.
 ●Forest City Foundries Co., Cleveland, O.
 ●Fox Furnace Co., Elyria, O.
 Green Foundry & Furnace Works, Des Moines, Ia.
 ●Hall-Neal Furnace Co., Indianapolis, Ind.
 ●Henry Furnace & Foundry Co., Cleveland, O.
 ●Hess Warming & Ventilating Co., Chicago, Ill.
 Holland Furnace Co., Holland, Mich.
 ●"Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.
 International Heater Co., Utica, N. Y.
 ●Joliet Heating Corp., Joliet, Ill.
 Keith Furnace Co., Des Moines, Ia.
 Kelsey Heating Co., Syracuse, N. Y.
 Koons Furnace Co., Danville, Ill.
 Lennox Furnace Co., Marshalltown, Ia.

- Liberty Foundry Co., St. Louis, Mo.
- MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
- Majestic Co., Huntington, Ind.
- Marshall Furnace Co., Marshall, Mich.
- May-Flebege Co., Newark, O.
- Meyer Furnace Co., Peoria, Ill.
- Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Nelson Corp., Herman, Moline, Ill.
- Peerless Foundry Co., Indianapolis, Ind.
- Pennsylvania Engineering Works, New Castle, Pa.
- Pennsylvania Furnace & Iron Co., Warren, Pa.
- Premier Furnace Co., Dowagiac, Mich.
- Richardson & Boynton Co., New York City.
- Robinson Furnace Co., Chicago, Ill.
- Robinson Heating & Ventilating Corp., Massillon, O.
- Rock Island Stove Co., Rock Island, Ill.
- Round Oak Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, O.
- Security Stove & Mfg. Co., Kansas City, Mo.
- Thatcher Co., Newark, N. J.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- Waterman-Waterbury Co., Minneapolis, Minn.
- Williamson Heater Co., Cincinnati, O.
- Wise Furnace Co., Akron, O.
- XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, AIR CONDITIONING, GAS BURNING

(Matched furnace-fan-filter-humidifier unit)

- Airtemp, Inc., Dayton, O.
- Aladdin Heating Corp., Oakland, Cal.
- American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace Co., St. Louis, Mo.
- Brown Sheet Iron & Steel Co., St. Paul, Minn.
- Bryant Corp., C. L., Cleveland, O.
- Bryant Heater Co., Cleveland, O.
- Campbell Heating Co., Des Moines, Ia.
- Carrier Corp., Newark, N. J.
- Dall Steel Products Co., Lansing, Mich.
- Des Moines Steel Furnace Co., Des Moines, Ia.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Electrogas Furnace & Mfg. Co., San Francisco, Cal.
- Evans Corp., Geo., Moline, Ill.
- Forest City Foundries Co., Cleveland, O.
- Fox Furnace Co., Elyria, O.
- General Electric Co., Schenectady, N. Y.
- Henry Furnace & Foundry Co., Cleveland, O.
- "Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.
- Joliet Heating Corp., Joliet, Ill.
- Koons Furnace Co., Danville, Ill.
- Lennox Furnace Co., Marshalltown, Ia., and Syracuse, N. Y.
- Meyer Furnace Co., Peoria, Ill.
- Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Payne Furnace & Supply Co., Beverly Hills, Cal.
- Premier Furnace Co., Dowagiac, Mich.
- Reynolds Corp., New York City.
- Robinson Heating & Ventilating Corp., Massillon, O.
- Rock Island Stove Co., Rock Island, Ill.
- Rudy Furnace Co., Dowagiac, Mich.
- Security Stove & Mfg. Co., Kansas City, Mo.
- Standard Furnace & Supply Co., Omaha, Nebr.
- Surface Combustion Corp., Toledo, O.
- Texo Sales & Mfg. Co., Cincinnati, O.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- Waterman-Waterbury Co., Minneapolis, Minn.
- XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, AIR CONDITIONING, OIL BURNING, WITH BURNER

(Matched furnace-fan-filter-humidifier unit)

- Airtemp, Inc., Dayton, O.
- American Furnace Co., St. Louis, Mo.
- Anchor Post Fence Co., Baltimore, Md.
- Arcweld Mfg. Co., Inc., Seattle, Wash.
- Autocrat Oil Burner Corp., Cedar Rapids, Ia.
- Campbell Heating Co., Des Moines, Ia.
- Carrier Corp., Newark, N. J.
- Century Engineering Corp., Cedar Rapids, Ia.
- Chicago Steel Furnace Co., Chicago, Ill.
- Dall Steel Products Co., Lansing, Mich.
- Delco-Frigidaire Conditioning Div., General Motors Sales Corp., Dayton, O.
- Des Moines Steel Furnace Co., Des Moines, Ia.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Electrol, Inc., Clifton, N. J.
- Fox Furnace Co., Elyria, O.
- French Rotary Oil Burner Co., Sebastopol, Cal.
- General Electric Co., Schenectady, N. Y.
- Gilbert & Barker Mfg. Co., Springfield, Mass.
- Green Foundry & Furnace Works, Des Moines, Ia.

- Hall-Neal Furnace Co., Indianapolis, Ind.
- Harvey-Whipple, Inc., Springfield, Mass.
- Heil Co., Milwaukee, Wis.
- Henry Furnace & Foundry Co., Cleveland, O.
- Hotentot Co., Inc., Omaha, Nebr.
- Kais Sunrise Works, Detroit, Mich.
- Keith Furnace Co., Des Moines, Ia.
- Koons Furnace Co., Danville, Ill.
- Leeson Co., T. F., Detroit, Mich.
- Little Burner Co., Inc., H. C., San Rafael, Cal.
- Lochinvar Corp., Detroit, Mich.
- Majestic Co., Huntington, Ind.
- May Oil Burner Corp., Baltimore, Md.
- Meyer Furnace Co., Peoria, Ill.
- Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Nelson Co., Detroit, Mich.
- Nelson Corp., Herman, Moline, Ill.
- Nomis Corp., Lafayette, Ind.
- Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.
- Nu-Way Corp., Rock Island, Ill.
- Oil Burner Builders, Inc., Bellevue, Ia.
- Perfect Burner Co., Lynn, Mass.
- Perfection Stove Co., Cleveland, O.
- Premier Furnace Co., Dowagiac, Mich.
- Reif-Rexoil, Inc., Buffalo, N. Y.
- Reynolds Corp., New York City.
- Rock Island Stove Co., Rock Island, Ill.
- Rudy Furnace Co., Dowagiac, Mich.
- Scott-Newcomb, Inc., St. Louis, Mo.
- Sundstrand Sales Co., Rockford, Ill.
- Syncro-Flame Burner Corp., Hartford, Conn.
- Tidewater Engineering Co., Gloucester, Mass.
- Timken Silent Automatic Div. The Timken-Detroit Axle Co., Detroit, Mich.
- Trane Co., LaCrosse, Wis.
- Waterman-Waterbury Co., Minneapolis, Minn.
- Wayne Oil Burner Corp., Ft. Wayne, Ind.
- Wood Industries, Inc., Gar, Detroit, Mich.

FURNACES, AIR CONDITIONING, OIL BURNING, WITHOUT BURNER

(Matched furnace-fan-filter-humidifier unit)

- American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace Co., St. Louis, Mo.
- Ames Co., W. R., San Francisco, Cal.
- Arcweld Mfg. Co., Inc., Seattle, Wash.
- Atlas Heating & Ventilating Co., San Francisco, Cal.
- Brown Sheet Iron & Steel Co., St. Paul, Minn.
- Bryan Plumbing & Heating Co., Bryan, O.
- Campbell Heating Co., Des Moines, Ia.
- Dall Steel Products Co., Lansing, Mich.
- Des Moines Steel Furnace Co., Des Moines, Ia.
- Economy Baler Co., Ann Arbor, Mich.
- Evans Corp., Geo., Moline, Ill.
- Falstrom Co., Passaic, N. J.
- Forest City Foundries Co., Cleveland, O.
- Fox Furnace Co., Elyria, O.
- French Rotary Oil Burner Co., Sebastopol, Cal.
- Green Foundry & Furnace Works, Des Moines, Ia.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Henry Furnace & Foundry Co., Cleveland, O.
- Hess Warming & Ventilating Co., Chicago, Ill.
- "Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.
- International Heater Company, Utica, N. Y.
- Joliet Heating Corp., Joliet, Ill.
- Keith Furnace Co., Des Moines, Ia.
- Koons Furnace Co., Danville, Ill.
- Lennox Furnace Co., Marshalltown, Ia. and Syracuse, N. Y.
- Liberty Foundry Co., St. Louis, Mo.
- Majestic Co., Huntington, Ind.
- Meyer Furnace Co., Peoria, Ill.
- Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Nelson Co., Detroit, Mich.
- Nomis Corp., Lafayette, Ind.
- Peerless Foundry Co., Indianapolis, Ind.
- Premier Furnace Co., Dowagiac, Mich.
- Richardson & Boynton Co., New York City.
- Rock Island Stove Co., Rock Island, Ill.
- Round Oak Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, O.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- Waterman-Waterbury Co., Minneapolis, Minn.
- XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, FLOOR

- Aladdin Heating Corp., Oakland, Cal.
- Andes Range & Furnace Corp., Geneva, N. Y.
- Armstrong Furnace Co., Columbus, O.
- Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.
- Beck Engineering Combustion Company, St. Louis, Mo.
- Cocking, Geo. J., Santa Ana, Cal.
- Coleman Lamp & Stove Co., Wichita, Kan.
- Des Moines Steel Furnace Co., Des Moines, Ia. (Gas)

- Dowagiac Steel Furnace Co., Dowagiac, Mich.
 Electrogas Furnace & Mfg. Co., San Francisco, Cal.
 Enterprise Foundry Co., Belleville, Ill.
 Estate Stove Co., Hamilton, O. (Gas)
 Excelsior Steel Furnace Co., Chicago, Ill.
 Falco Furnace Co., San Francisco, Cal.
 Foss Heating & Engineering Co., Pasadena, Cal.
 ● Fox Furnace Co., Elyria, O. (Gas)
 Fraser Furnace Co., Stockton, Cal.
 Gem City Stove Co., Dayton, O.
 ● Hall-Neal Furnace Co., Indianapolis, Ind.
 Heckler Bros., Pittsburgh, Pa. (Gas)
 ● Henry Furnace & Foundry Co., Cleveland, O.
 Holland Furnace Co., Holland, Mich.
 Johnston Gas Furnace Corp., Los Angeles, Cal.
 Koons Furnace Co., Danville, Ill.
 Little Burner Co., Inc., H. C., San Rafael, Cal. (Oil burning)
 Marshall Furnace Co., Marshall, Mich.
 Miller Floor Furnace Co., Oakland, Cal.
 Milwaukee Welded Steel Corp., Milwaukee, Wis.
 ● Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
 ● Pacific Gas Radiator Co., Los Angeles, Cal.
 ● Payne Furnace & Supply Co., Beverly Hills, Cal.
 Pennsylvania Furnace & Iron Co., Warren, Pa.
 Rock Island Stove Co., Rock Island, Ill.
 ● Rudy Furnace Co., Dowagiac, Mich.
 Security Stove & Mfg. Co., Kansas City, Mo. (Gas)
 ● Surface Combustion Corp., Toledo, O.
 Ward Heater Co., Ltd., Los Angeles, Cal.
 ● Waterman-Waterbury Co., Minneapolis, Minn.

FURNACES, SOLDERING

- Bernz Co., Inc., Otto, Rochester, N. Y.
 Burgess Soldering Furnace Co., Columbus, O. (Gasoline)
 Clayton & Lambert Mfg. Co., Detroit, Mich.
 Diener Mfg. Co., Geo. W., Chicago, Ill.
 Electric Soldering Iron Co., Inc., New York City.
 Hones, Inc., Charles A., Baldwin, N. Y.
 Johnson Gas Appliance Co., Cedar Rapids, Ia.
 Liquefied Gas Appliance Co., Mars, Pa.
 Roper Corp., Geo. D., Rockford, Ill.
 Turner Brass Works, Sycamore, Ill.
 Wall Mfg. Supply Co., P., Pittsburgh, Pa.

FURNACES, WARM AIR, GRAVITY, COAL BURNING, CAST IRON

- Agricola Furnace Co., Inc., Gadsden, Ala.
 ● American Foundry & Furnace Co., Bloomington, Ill.
 American Furnace Co., St. Louis, Mo.
 American Furnace & Foundry Co., Milan, Mich.
 Andes Range & Furnace Corp., Geneva, N. Y.
 Barry Furnace Co., Hamilton, O.
 Bergstrom Mfg. Corp., Neenah, Wis.
 ● Brillion Furnace Co., Brillion, Wis.
 ● Chandler Co., Cedar Rapids, Ia.
 Cleveland Co-Operative Stove Co., Cleveland, O.
 Columbus Heating & Ventilating Co., Columbus, O.
 Danville Stove & Mfg. Co., Danville, Pa.
 Dayton Casting Co., Dayton, O.
 Detroit Michigan Stove Co., Detroit, Mich.
 Dowagiac Steel Furnace Co., Dowagiac, Mich.
 Edwards Furnace Co., Wellsboro, Pa.
 Emrich Co., C., Columbus, O.
 Enterprise Boiler & Tank Works, Inc., Chicago, Ill.
 Enterprise Foundry Co., Belleville, Ill.
 Excelsior Steel Furnace Co., Chicago, Ill.
 Excelsior Stove & Mfg. Co., Quincy, Ill.
 Farris Furnace Co., Springfield, Ill.
 Faultless Heater Corp., Cleveland, O.
 ● Favorite Mfg. Co., Piqua, O.
 Floral City Co., Monroe, Mich.
 Floyd-Wells Co., Royersford, Pa.
 Foote Foundry Co., J. B., Fredericktown, O.
 ● Forest City Foundries Co., Cleveland, O.
 ● Fox Furnace Co., Elyria, O.
 Fuller-Warren Co., Milwaukee, Wis.
 Gem City Stove Co., Dayton, O.
 Germer Stove Co., Erie, Pa.
 Green Foundry & Furnace Works, Des Moines, Ia.
 ● Hall-Neal Furnace Co., Indianapolis, Ind.
 Halstead Iron Foundry, Halstead, Pa.
 Harold Furnace Mfg. Co., Spokane, Wash.
 Hart & Crouse Co., Inc., Utica, N. Y.
 Hart Mfg. Co., Louisville, Ky.
 Heckler Bros., Pittsburgh, Pa.
 ● Henry Furnace & Foundry Co., Cleveland, O.
 ● Hess-Snyder Co., Massillon, O.
 Holland Furnace Co., Holland, Mich.
 ● "Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.
 Home Furnace Co., Holland, Mich.
 Home Stove Co., Indianapolis, Ind.
 Ideal Furnace Co., Detroit, Mich.
 Independence Stove & Furnace Co., Independence, Mo.
 International Heater Co., Utica, N. Y.
 Iowa Foundry Co., Sioux City, Ia.
 Kalamazoo Stove Co., Kalamazoo, Mich.
 Kansas City Furnace Co., Kansas City, Mo.
 Keith Furnace Co., Des Moines, Ia.

- Kelsey Heating Co., Syracuse, N. Y.
 Klein Stove Co., Philadelphia, Pa.
 Liberty Foundry Co., St. Louis, Mo.
 McPherson Furnace & Supply Co., Portland, Ore.
 MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
 Majestic Co., Huntington, Ind.
 Maple City Furnace Co., Monmouth, Ill.
 Marshall Furnace Co., Marshall, Mich.
 May-Fiebeger Co., Newark, O.
 ● Meyer Furnace Co., Peoria, Ill.
 Miller Range & Furnace Co., Wm., Cincinnati, O.
 Montag Stove & Furnace Works, Portland, Ore.
 Moore Corp., Joliet, Ill.
 ● Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
 ● Mueller Furnace Co., L. J., Milwaukee, Wis.
 Oakland Foundry Co., Belleville, Ill.
 Orbon Stove Co., Belleville, Ill.
 ● Osborn Co., J. M. & L. A., Cleveland, O.
 ● Peerless Foundry Co., Indianapolis, Ind.
 Phillips Heating, Ventilating & Mfg. Co., Los Angeles, Cal.
 Pittston Stove Co., Pittston, Pa.
 ● Premier Furnace Co., Dowagiac, Mich.
 Richardson & Boynton Co., New York City.
 Robinson Furnace Co., Chicago, Ill.
 Rock Island Stove Co., Rock Island, Ill.
 Round Oak Co., Dowagiac, Mich.
 ● Rudy Furnace Co., Dowagiac, Mich.
 ● Rybolt Heater Co., Ashland, O.
 St. Clair Foundry Corp., Centralia, Ill.
 Schill Mfg. Co., Crestline, O.
 ● Schwab Furnace & Mfg. Co., Cedar Grove, Wis.
 Security Stove & Mfg. Co., Kansas City, Mo.
 Spear Stove & Heating Co., James, Philadelphia, Pa.
 ● Standard Foundry & Furnace Co., De Kalb, Ill.
 Standard Furnace & Supply Co., Omaha, Nebr.
 Stanton Heater Co., Martins Ferry, O.
 Stratton & Terstegge Co., Louisville, Ky.
 Thatcher Co., Newark, N. J.
 ● Twentieth Century Heating & Ventilating Co., Akron, O.
 United States Radiator Corp., Detroit, Mich.
 Walker & Pratt Mfg. Co., Boston, Mass.
 Washington Stove Works, Everett, Wash.
 Western Furnaces, Inc., Tacoma, Wash.
 Westwick & Son, Inc., John, Galena, Ill.
 Williamson Heater Co., Cincinnati, O.
 ● Wise Furnace Co., Akron, O.
 ● XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, GRAVITY, COAL BURNING, STEEL

- American Foundry & Furnace Co., Bloomington, Ill.
 American Furnace Co., St. Louis, Mo.
 American Furnace & Foundry Co., Milan, Mich. (Combination Cast Iron & Steel)
 Arcweld Mfg. Co., Inc., Seattle, Wash.
 Armstrong Furnace Co., Columbus, O.
 Baker Furnace & Cleaner Mfg. Co., Toledo, O.
 Brown Sheet Iron & Steel Co., St. Paul, Minn.
 Campbell Heating Co., Des Moines, Ia.
 Campbell Heating Co., E. K., Kansas City, Mo.
 Cole Hot Blast Mfg. Co., Chicago, Ill.
 ● Dall Steel Products Co., Lansing, Mich.
 Daniels Mfg. Co., Inc., Sam, Hardwick, Vt.
 Deshler Foundry & Mach. Wks., Deshler, O.
 Detroit Michigan Stove Co., Detroit, Mich.
 Dowagiac Steel Furnace Co., Dowagiac, Mich.
 Enterprise Boiler & Tank Works, Inc., Chicago, Ill.
 Excelsior Steel Furnace Co., Chicago, Ill.
 Farquhar Furnace Co., Wilmington, O.
 Faultless Heater Corp., Cleveland, O.
 Floral City Co., Monroe, Mich.
 ● Forest City Foundries Co., Cleveland, O.
 ● Fox Furnace Co., Elyria, O.
 Gehrl Co., Tacoma, Wash.
 ● Hall-Neal Furnace Co., Indianapolis, Ind.
 Hart Mfg. Co., Louisville, Ky.
 ● Henry Furnace & Foundry Co., Cleveland, O.
 ● Hess-Snyder Co., Massillon, O.
 ● Hess-Warming & Ventilating Co., Chicago, Ill.
 ● "Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.
 Home Stove Co., Indianapolis, Ind.
 Ideal Furnace Co., Detroit, Mich.
 International Heater Co., Utica, N. Y.
 Iowa Foundry Co., Sioux City, Ia.
 ● Joliet Heating Corp., Joliet, Ill.
 Keith Furnace Co., Des Moines, Ia.
 Koons Furnace Co., Danville, Ill.
 Kruse & Dewenter Co., Indianapolis, Ind.
 Lee Heating Systems, Youngstown, O.
 Lennox Furnace Co., Marshalltown, Ia.
 Liberty Foundry Co., St. Louis, Mo.
 Lookout Furnace Co., Chattanooga, Tenn.
 MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
 Majestic Co., Huntington, Ind.
 Majestic Furnace Co., Seattle, Wash.
 Marshall Furnace Co., Marshall, Mich.
 May-Fiebeger Co., Newark, O.
 ● Meyer Furnace Co., Peoria, Ill.
 Milwaukee Welded Steel Corp., Milwaukee, Wis.
 Montag Stove & Furnace Works, Portland, Ore.

- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Nelson Co., Detroit, Mich.
- Nugent Sons, Inc., Thos., New York City.
- Patten Co., J. V., Sycamore, Ill.
- Peerless Foundry Co., Indianapolis, Ind.
- Pennsylvania Engineering Works, New Castle, Pa.
- Pennsylvania Furnace & Iron Co., Warren, Pa.
- Perfect Burner Co., Lynn, Mass.
- Premier Furnace Co., Dowagiac, Mich.
- Ramey Mfg. Co., Columbus, O.
- Ribside Furnace Co., Wausau, Wis.
- Richardson & Boynton Co., New York City.
- Roberts-Hamilton Co., Minneapolis, Minn.
- Robinson Heating & Ventilating Corp., Massillon, O.
- Rosebraugh Co., W. W., Salem, Ore.
- Round Oak Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, O.
- Schill Mfg. Co., Crestline, O.
- Schwab Furnace & Mfg. Co., Cedar Grove, Wis.
- Smuck-Thiele Co., Indianapolis, Ind.
- Stratton & Terstegge Co., Louisville, Ky.
- Thatcher Co., Newark, N. J.
- Thompson Mfg. Co., Denver, Colo.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- U. S. Pressed Steel Products Co., Kalamazoo, Mich.
- Waterman-Waterbury Co., Minneapolis, Minn.
- Williamson Heater Co., Cincinnati, O.
- Wise Furnace Co., Akron, O.
- XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, GRAVITY, GAS BURNING, CAST IRON

- American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace Co., St. Louis, Mo.
- Beck Engineering Combustion Company, St. Louis, Mo.
- Bryant Heater Co., Cleveland, O.
- Favorite Mfg. Co., Piqua, O.
- Forest City Foundries Co., Cleveland, O.
- Fox Furnace Co., Elyria, O.
- Green Foundry & Furnace Works, Des Moines, Ia.
- Hart Mfg. Co., Louisville, Ky.
- Henry Furnace & Foundry Co., Cleveland, O.
- "Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.
- Jackson Sheet Metal Works, Ogden, Utah. (Combination Iron and Steel)
- Johnson Gas Furnace Corp., Los Angeles, Cal.
- Kelsey Heating Co., Syracuse, N. Y.
- Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Phillips Heating, Ventilating & Mfg. Co., Los Angeles, Cal.
- Reznor Mfg. Co., Mercer, Pa.
- Rudy Furnace Co., Dowagiac, Mich.
- Standard Furnace & Supply Co., Omaha, Nebr.
- Ward Heater Co., Ltd., Los Angeles, Cal.
- Wise Furnace Co., Akron, O.

FURNACES, WARM AIR, GRAVITY, GAS BURNING, STEEL

(Complete with burner)

- Aladdin Heating Corp., Oakland, Cal.
- American Furnace Co., St. Louis, Mo.
- Armstrong Furnace Co., Columbus, O.
- Atlas Heating & Ventilating Co., Ltd., San Francisco, Cal.
- Brown Sheet Iron & Steel Co., St. Paul, Minn.
- Bryant Corp., C. L., Cleveland, O.
- Burmester Gas Furnace Mfg. Co., Omaha, Nebr. (Sheet Iron)
- Calkins & Pearce, Columbus, O.
- Cocking, Geo. J., Santa Ana, Cal.
- Dall Steel Products Co., Lansing, Mich.
- Des Moines Steel Furnace Co., Des Moines, Ia.
- Detroit Michigan Stove Co., Detroit, Mich.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Electrogas Furnace & Mfg. Co., San Francisco, Cal.
- Falco Furnace Co., San Francisco, Cal.
- Forest City Foundries Co., Cleveland, O.
- Foss Heating & Engineering Co., Pasadena, Cal.
- Fox Furnace Co., Elyria, O.
- Heckler Bros., Pittsburgh, Pa.
- Hess-Snyder Co., Massillon, O.
- Independence Stove & Furnace Co., Independence, Mo.
- Johnston Gas Furnace Corp., Los Angeles, Cal.
- Lee Heating Systems, Youngstown, O.
- Lennox Furnace Co., Marshalltown, Ia.
- Meyer Furnace Co., Peoria, Ill.
- Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Nelson Co., Detroit, Mich.
- Norge Heating & Conditioning Div. of Borg-Warner Corp., Detroit, Mich.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Payne Furnace & Supply Co., Beverly Hills, Cal.
- Pennsylvania Furnace & Iron Co., Warren, Pa.
- Phillips Heating, Ventilating & Mfg. Co., Los Angeles, Cal.
- Reznor Mfg. Co., Mercer, Pa.

- Robinson Heating & Ventilating Corp., Massillon, O.
- Ryniker Sheet Metal Works, Inc., Billings, Mont.
- Scott-Newcomb, Inc., St. Louis, Mo.
- Security Stove & Mfg. Co., Kansas City, Mo.
- Surface Combustion Corp., Toledo, O.
- Texo Sales & Mfg. Co., Cincinnati, O.
- Thompson Mfg. Co., Denver, Colo.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- Ward Heater Co., Ltd., Los Angeles, Cal.
- Waterman-Waterbury Co., Minneapolis, Minn.
- XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, GRAVITY, OIL BURNING, CAST IRON

(No burner furnished)

- Airtherm Mfg. Co., St. Louis, Mo.
- Andes Range & Furnace Corp., Geneva, N. Y.
- Chandler Co., Cedar Rapids, Ia.
- Detroit Michigan Stove Co., Detroit, Mich.
- Edwards Furnace Co., Wellsboro, Pa.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Forest City Foundries Co., Cleveland, O.
- Green Foundry & Furnace Works, Des Moines, Ia.
- Hart & Crouse Co., Inc., Utica, N. Y.
- Henry Furnace & Foundry Co., Cleveland, O.
- Ideal Furnace Co., Detroit, Mich.
- International Heater Co., Utica, N. Y.
- Keith Furnace Co., Des Moines, Ia.
- Kelsey Heating Co., Syracuse, N. Y.
- MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
- Marshall Furnace Co., Marshall, Mich.
- Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
- Reif-Rexoll, Inc., Buffalo, N. Y.
- Rudy Furnace Co., Dowagiac, Mich.
- Schwab Furnace & Mfg. Co., Cedar Grove, Wis.
- Spear Stove & Heating Co., James, Philadelphia, Pa.
- Thatcher Co., Newark, N. J.

FURNACES, WARM AIR, GRAVITY, OIL BURNING, STEEL

(No burner furnished)

- American Furnace Co., St. Louis, Mo.
- Arcweld Mfg. Co., Inc., Seattle, Wash.
- Armstrong Furnace Co., Columbus, O.
- Baker Furnace & Cleaner Mfg. Co., Toledo, O.
- Brown Sheet Iron & Steel Co., St. Paul, Minn.
- Bryan Plumbing & Heating Co., Bryan, O.
- Campbell Heating Co., E. K., Kansas City, Mo.
- Cary Mfg. Co., Waupaca, Wis.
- Dall Steel Products Co., Lansing, Mich.
- Des Moines Steel Furnace Co., Des Moines, Ia.
- Detroit Michigan Stove Co., Detroit, Mich.
- Dowagiac Steel Furnace Co., Dowagiac, Mich.
- Economy Baler Co., Ann Arbor, Mich.
- Enterprise Boiler & Tank Wks., Inc., Chicago, Ill.
- Evans Corp., George, Moline, Ill.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Farquhar Furnace Co., Wilmington, O.
- Forest City Foundries Co., Cleveland, O.
- Fox Furnace Co., Elyria, O.
- Gehrl Co., Tacoma, Wash.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Henry Furnace & Foundry Co., Cleveland, O.
- Hess-Snyder Co., Massillon, O.
- Hess Warming & Ventilating Co., Chicago, Ill.
- "Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.
- Ideal Furnace Co., Detroit, Mich.
- Joliet Heating Corp., Joliet, Ill.
- Keith Furnace Co., Des Moines, Ia.
- Kelsey Heating Co., Syracuse, N. Y.
- Koons Furnace Co., Danville, Ill.
- Kruse Co., Inc., Indianapolis, Ind.
- Kruse & Dewenter Co., Indianapolis, Ind.
- Lee Heating Systems, Youngstown, O.
- Lennox Furnace Co., Marshalltown, Ia.
- Liberty Foundry Co., St. Louis, Mo.
- Lookout Furnace Co., Chattanooga, Tenn.
- MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
- Marshall Furnace Co., Marshall, Mich.
- Meyer Furnace Co., Peoria, Ill.
- Milwaukee Welded Steel Corp., Milwaukee, Wis.
- Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Nelson Co., Detroit, Mich.
- Oil Burner Builders, Inc., Bellevue, Ia.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Peerless Foundry Co., Indianapolis, Ind.
- Premier Furnace Co., Dowagiac, Mich.
- Rock Island Stove Co., Rock Island, Ill.
- Rosebraugh Co., W. W., Salem, Ore.
- Round Oak Co., Dowagiac, Mich.
- Scott-Newcomb, Inc., St. Louis, Mo.
- Schwab Furnace & Mfg. Co., Cedar Grove, Wis.
- Smuck-Thiele Co., Indianapolis, Ind.
- Thatcher Co., Newark, N. J.

- Thompson Mfg. Co., Denver, Col.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- U. S. Pressed Steel Products Co., Kalamazoo, Mich.
- Waterman-Waterbury Co., Minneapolis, Minn.
- Wise Furnace Co., Akron, O.
- XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, GRAVITY, OIL BURNING, CAST IRON

(Complete with burner)

- Arcweld Mfg. Co., Inc., Seattle, Wash.
- Forest City Foundries Co., Cleveland, O.
- Green Foundry & Furnace Works, Des Moines, Ia.
- Harvey-Whipple, Inc., Springfield, Mass.
- Ideal Furnace Co., Detroit, Mich.
- Keith Furnace Co., Des Moines, Ia.

FURNACES, WARM AIR, GRAVITY, OIL BURNING, STEEL

(Complete with burner)

- American Furnace Co., St. Louis, Mo.
- Arcweld Mfg. Co., Inc., Seattle, Wash.
- Armstrong Furnace Co., Columbus, O.
- Auburn Burner Corp., Auburn, Ind.
- Baker Furnace & Cleaner Mfg. Co., Toledo, O.
- Cary Mfg. Co., Waupaca, Wis.
- Century Engineering Corp., Cedar Rapids, Ia.
- Des Moines Steel Furnace Co., Des Moines, Ia.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Forest City Foundries Co., Cleveland, O.
- French Rotary Oil Burner Co., Sebastopol, Cal.
- Gilbert & Barker Mfg. Co., Springfield, Mass.
- Green Foundry & Furnace Works, Des Moines, Ia.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Health Air Systems, Inc., Detroit, Mich.
- Heil Co., Milwaukee, Wis.
- Hotentot Co., Inc., Omaha, Nebr.
- Ingle Mfg. Co., San Diego, Cal.
- Joliet Heating Corp., Joliet, Ill.
- Keith Furnace Co., Des Moines, Ia.
- Koons Furnace Co., Danville, Ill.
- Kruse Co., Inc., Indianapolis, Ind.
- Lee Heating Systems, Youngstown, O.
- Little Burner Co., Inc., H. C., San Rafael, Cal.
- Lochinvar Corp., Detroit, Mich.
- Meyer Furnace Co., Peoria, Ill.
- Montag Stove & Furnace Works, Portland, Ore.
- Motor Wheel Corp., Lansing, Mich.
- Nelson Co., Detroit, Mich.
- Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.
- Nu-Way Corp., Rock Island, Ill.
- Oil Burner Builders, Inc., Bellevue, Ia.
- Perfect Burner Co., Lynn, Mass.
- Perfection Stove Co., Cleveland, O.
- Reif-Rexoil, Inc., Buffalo, N. Y.
- Scott-Newcomb, Inc., St. Louis, Mo.
- Waterman-Waterbury Co., Minneapolis, Minn.
- Wayne Oil Burner Corp., Fort Wayne, Ind.
- Wood Industries, Inc., Gar, Detroit, Mich.
- York Oil Burner Co., Inc., York, Pa.

FURNACES, WARM AIR, HORIZONTAL

- Acme Heating & Ventilating Co., Chicago, Ill.
- American Foundry & Furnace Co., Bloomington, Ill.
- Columbus Heating & Ventilating Co., Columbus, O.
- Floral City Co., Monroe, Mich.
- Forest City Foundries Co., Cleveland, O.
- Gehri Co., Tacoma, Wash.
- Kruse & Dewenter Co., Indianapolis, Ind.
- MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
- Majestic Co., Huntington, Ind.
- McPherson Furnace & Supply Co., Portland, Ore.
- Moncrief Furnace Co., Atlanta, Ga.
- Montag Stove & Furnace Works, Portland, Ore.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Nelson Co., Detroit, Mich.
- New York Blower Co., Chicago, Ill.
- Rosebraugh Co., W. W., Salem, Ore.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- Western Furnaces, Inc., Tacoma, Wash.
- XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, PIPELESS, CAST IRON

- Agricola Furnace Co., Inc., Gadsden, Ala.
- American Foundry & Furnace Co., Bloomington, Ill.
- American Furnace Co., St. Louis, Mo.
- American Furnace & Foundry Co., Milan, Mich.
- Andes Range & Furnace Corp., Geneva, N. Y.
- Barry Furnace Co., Hamilton, O.

- Brillion Furnace Co., Brillion, Wis.
- Chandler Co., Cedar Rapids, Ia.
- Danville Stove & Mfg. Co., Danville, Pa.
- Detroit Michigan Stove Co., Detroit, Mich.
- Dowagiac Steel Furnace Co., Dowagiac, Mich.
- Edwards Furnace Co., Wellsboro, Pa.
- Emrich Co., C., Columbus, O.
- Enterprise Boiler & Tank Works, Inc., Chicago, Ill.
- Enterprise Foundry Co., Belleville, Ill.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Excelsior Stove & Mfg. Co., Quincy, Ill.
- Favorite Mfg. Co., Piqua, O.
- Floral City Co., Monroe, Mich.
- Floyd-Wells Co., Royersford, Pa.
- Forest City Foundries Co., Cleveland, O.
- Fox Furnace Co., Elyria, O.
- Green Foundry & Furnace Works, Des Moines, Ia.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Harold Furnace Mfg. Co., Spokane, Wash.
- Hart & Crouse Co., Inc., Utica, N. Y.
- Hart Mfg. Co., Louisville, Ky.
- Heckler Bros., Pittsburgh, Pa.
- Henry Furnace & Foundry Co., Cleveland, O.
- "Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.
- Home Furnace Co., Holland, Mich.
- Home Stove Co., Indianapolis, Ind.
- Ideal Furnace Co., Detroit, Mich.
- International Heater Co., Utica, N. Y.
- Johnston Gas Furnace Corp., Los Angeles, Cal. (Gas)
- Kalamazoo Stove Co., Kalamazoo, Mich.
- Kansas City Furnace Co., Kansas City, Mo.
- Keith Furnace Co., Des Moines, Ia.
- Kelsey Heating Co., Syracuse, N. Y.
- Liberty Foundry Co., St. Louis, Mo.
- MaGirl Foundry & Furnace Works, P. H. Bloomington, Ill.
- Maple City Furnace Co., Monmouth, Ill.
- Marshall Furnace Co., Marshall, Mich.
- May-Flebeiger Co., Newark, O.
- Montag Stove & Furnace Works, Portland, Ore.
- Moore Corp., Joliet, Ill.
- Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Orbon Stove Co., Belleville, Ill.
- Pittston Stove Co., Pittston, Pa.
- Premier Furnace Co., Dowagiac, Mich.
- Ravenna Furnace & Heating Co., Ravenna, O.
- Richardson & Boynton Co., New York City.
- Robinson Furnace Co., Chicago, Ill.
- Round Oak Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- Rybolt Heater Co., Ashland, O.
- St. Clair Foundry Corp., Centerville, Ill.
- Schill Mfg. Co., Crestline, O.
- Schwab Furnace & Mfg. Co., Cedar Grove, Wis.
- Security Stove & Mfg. Co., Kansas City, Mo.
- Standard Foundry & Furnace Co., DeKalb, Ill.
- Standard Furnace & Supply Co., Omaha, Nebr.
- Thatcher Co., Newark, N. J.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- Walker & Pratt Mfg. Co., Boston, Mass.
- Ward Heater Co., Ltd., Los Angeles, Cal.
- Washington Stove Works, Everett, Wash.
- Western Furnaces, Inc., Tacoma, Wash.
- Westwick & Son, Inc., John, Galena, Ill.
- Williamson Heater Co., Cincinnati, O.
- Wise Furnace Co., Akron, O.
- XXth Century Heating & Ventilating Co., Akron, O.

FURNACES, WARM AIR, PIPELESS, STEEL

- Aladdin Heating Corp., Oakland, Cal.
- American Furnace & Foundry Co., Milan, Mich.
- Arcweld Mfg. Co., Inc., Seattle, Wash.
- Armstrong Furnace Co., Columbus, O.
- Brown Sheet Iron & Steel Co., St. Paul, Minn.
- Campbell Heating Co., Des Moines, Ia.
- Daniels Mfg. Co., Inc., Sam, Hardwick, Vt.
- Detroit Michigan Stove Co., Detroit, Mich.
- Dowagiac Steel Furnace Co., Dowagiac, Mich.
- Electrogas Furnace & Mfg. Co., San Francisco, Cal.
- Enterprise Boiler & Tank Works, Inc., Chicago, Ill.
- Falco Furnace Co., San Francisco, Cal.
- Floral City Co., Monroe, Mich.
- Forest City Foundries Co., Cleveland, O.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Hart Mfg. Co., Louisville, Ky.
- Henry Furnace & Foundry Co., Cleveland, O.
- Hess Warming & Ventilating Co., Chicago, Ill.
- "Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.
- Home Stove Co., Indianapolis, Ind.
- Ideal Furnace Co., Detroit, Mich.
- Ingle Mfg. Co., San Diego, Cal.
- International Heater Co., Utica, N. Y.
- Keith Furnace Co., Des Moines, Ia.
- Kelsey Heating Co., Syracuse, N. Y.
- Klein Stove Co., Philadelphia, Pa.
- Koons Furnace Co., Danville, Ill.
- Kruse & Dewenter Co., Indianapolis, Ind.
- Lennox Furnace Co., Marshalltown, Ia.
- Liberty Foundry Co., St. Louis, Mo.

- MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
 Majestic Furnace Co., Seattle, Wash.
 Marshall Furnace Co., Marshall, Mich.
 ●Meyer Furnace Co., Peoria, Ill.
 Montag Stove & Furnace Works, Portland, Ore.
 Nugent Sons, Inc., Thos., New York City
 Orbon Stove Co., Belleville, Ill.
 ●Pacific Gas Radiator Co., Los Angeles, Cal.
 ●Payne Furnace & Supply Co., Beverly Hills, Cal.
 ●Peerless Foundry Co., Indianapolis, Ind.
 Pennsylvania Furnace & Iron Co., Warren, Pa.
 Roberts-Hamilton Co., Minneapolis, Minn.
 Robinson Heating & Ventilating Corp., Massillon, O.
 Rosebraugh Co., W. W., Salem, Ore.
 Round Oak Co., Dowagiac, Mich.
 Schill Mfg. Co., Crestline, O.
 Stanton Heater Co., Martins Ferry, O.
 Thompson Mfg. Co., Denver, Colo.
 ●Twentieth Century Heating & Ventilating Co., Akron, O.
 U. S. Pressed Steel Products Co., Kalamazoo, Mich.
 Ward Heater Co., Ltd., Los Angeles, Cal.
 ●Waterman-Waterbury Co., Minneapolis, Minn.
 ●Wise Furnace Co., Akron, O.
 ●XXth Century Heating & Ventilating Co., Akron, O.

GAGES, DRAFT

- Bacharach Industrial Instrument Co., Pittsburgh, Pa.
 Bailey Meter Co., Cleveland, O.
 Bristol Co., Waterbury, Conn.
 Brown Instrument Co., Div. of Minneapolis-Honeywell Regulator Co., Philadelphia, Pa.
 Consolidated Ashcroft Hancock Co., Inc., Bridgeport, Conn.
 Ellison Draft Gage Co., Chicago, Ill.
 Foxboro Co., Foxboro, Mass.
 ●Friez & Sons, Inc., Julien P., Baltimore, Md.
 Hays Corp., Michigan City, Ind.
 Hill Co., E. Vernon, Chicago, Ill.
 Hotstream Heater Co., The, Cleveland, O.
 Moeller Instrument Co., Brooklyn, N. Y.
 Precision Thermometer & Instrument Co., Philadelphia, Pa.

GAS BURNERS

See Burners, Gas, Conversion

GAS PRESSURE REGULATING VALVES

See Valves, Gas Pressure Regulating

GLAZING COMPOUNDS

See Compounds, Glazing

GRILLES, HEATING AND VENTILATING

- American Blower Corp., Detroit, Mich.
 ●American Foundry & Furnace Co., Bloomington, Ill.
 ●Auer Register Co., Cleveland, O.
 ●Barber-Colman Co., Rockford, Ill.
 Best Register Co., Milwaukee, Wis.
 Carrier Corp., Newark, N. J.
 Central Wire & Iron Works, Des Moines, Ia.
 Chase Brass & Copper Co., Inc., Waterbury, Conn.
 Chicago Perforating Co., Chicago, Ill.
 Cincinnati Mfg. Co., Cincinnati, O.
 Cross Engineering Co., Carbondale, Pa.
 Decatur Iron & Steel Co., Decatur, Ala.
 Diamond Mfg. Co., Wyoming, Pa.
 Erdle Perforating Co., Rochester, N. Y.
 Gillian Mfg. Co., Detroit, Mich.
 Globe Machine & Stamping Co., Cleveland, O.
 ●Harrington & King Perforating Co., Chicago, Ill.
 ●Hart & Cooley Mfg. Co., Chicago, Ill.
 Hendrick Mfg. Co., Carbondale, Pa.
 ●Independent Register Co., Cleveland, O.
 Johnson & Chapman Co., Chicago, Ill.
 ●Lamneck Products, Inc., Columbus, O.
 Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.
 Metalace Corp., South Boston, Mass.
 ●Mueller Furnace Co., L. J., Milwaukee, Wis.
 Mundt & Sons, Charles, Jersey City, N. J.
 Newman Brothers, Inc., Cincinnati, O.
 ●Payne Furnace & Supply Co., Beverly Hills, Cal.
 ●Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
 Roberts-Hamilton Co., Minneapolis, Minn.
 ●Rock Island Register Co., Rock Island, Ill.
 ●Trane Co., La Crosse, Wis.
 ●Tuttle & Bailey, Inc., New Britain, Conn.
 ●United States Register Co., Battle Creek, Mich.
 ●Waterloo Register Co., Waterloo, Ia.
 Western Wire & Iron Works, Inc., Chicago, Ill.
 ●Wickwire Spencer Steel Co., New York City.

GUARDS, SNOW

- Berger Co., L. D., Philadelphia, Pa.
 ●Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.

- Chase Brass & Copper Co., Inc., Waterbury, Conn.
 Danzer Metal Works, Inc., Hagerstown, Md.
 Downs-Smith Brass & Copper Co., Long Island City, N. Y.
 Folsom Snow Guard Co., Boston, Mass.
 ●Hussey & Co., C. G., Pittsburgh, Pa. (Copper)
 Levow, David, New York City.
 Southbridge Roofing Co., Inc., Southbridge, Mass.
 Western Wire & Iron Works, Inc., Chicago, Ill.
 ●Wickwire Spencer Steel Co., New York City.

GUNS, SPRAY, PAINT

- Binks Mfg. Co., Chicago, Ill.
 De Vilbiss Co., Toledo, O.
 Electric Sprayit Co., Milwaukee, Wis.
 Imperial Brass Mfg. Co., Chicago, Ill.

GUNS, SPRAY, METALS

- Binks Mfg. Co., Chicago, Ill.
 Metals Coating Co. of America, Philadelphia, Pa.

GUTTERS

See Eaves Trough and Gutters

HEAT TRANSFER SURFACE

See Coils, Cooling, Direct Expansion; Coils, Heating; Coils, Cooling, Water

HEATERS, CABINET

- Agricola Furnace Co., Inc., Gadsden, Ala.
 American Gas Products Corp., New York City
 American Radiator Co., New York City.
 Beck Engineering Combustion Kompany, St. Louis, Mo.
 Cary Mfg. Co., Waupaca, Wis.
 Continental Stove Corp., Ironton, O. (Gas).
 Corozone Air Conditioning Corp., Cleveland, O. (Gas).
 Emrich Co., C., Columbus, O.
 Estate Stove Co., Hamilton, O.
 Excelsior Stove & Mfg. Co., Quincy, Ill.
 Floyd-Wells Co., Royersford, Pa.
 Fox Engineering Co., Boston, Mass.
 ●Fox Furnace Co., Elyria, O.
 Hart Mfg. Co., Louisville, Ky. (Coal and Gas).
 Hayes Custer Stove Co., Bloomington, Ill.
 Home Stove Co., Indianapolis, Ind.
 Independence Stove & Furnace Co., Independence, Mo.
 Ingle Mfg. Co., San Diego, Cal.
 Kalamazoo Stove Co., Kalamazoo, Mich.
 Little Burner Co., Inc., H. C., San Rafael, Cal. (Oil Burning).
 ●Lochinvar Corp., Detroit, Mich. (Oil Burning)
 Montag Stove & Furnace Works, Portland, Ore.
 Moore Corp., Joliet, Ill.
 Motor Wheel Corp., Lansing, Mich.
 ●Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill. (Coal, Oil and Gas).
 Norge Heating & Conditioning Div. of Borg-Warner Corp., Detroit, Mich. (Oil).
 Orbon Stove Co., Belleville, Ill.
 ●Pacific Gas Radiator Co., Los Angeles, Cal.
 Patten Co., J. V., Sycamore, Ill. (Coal and Gas).
 ●Payne Furnace & Supply Co., Beverly Hills, Cal.
 Perfection Stove Co., Cleveland, O.
 ●Premier Furnace Co., Dowagiac, Mich.
 Quaker Mfg. Co., Chicago, Ill. (Oil).
 Regal Metal Products Co., Chicago, Ill.
 Reznor Mfg. Co., Mercer, Pa.
 Rock Island Stove Co., Rock Island, Ill.
 Schoedinger Co., F. O., Columbus, O.
 Security Stove & Mfg. Co., Kansas City, Mo.
 Silent Glow Oil Burner Corp., Hartford, Conn.
 Silent Sloux Oil Burner Corp., Orange City, Ia. (Oil).
 Texo Sales & Mfg. Co., Cincinnati, O. (Gas).
 Ward Heater Co., Ltd., Los Angeles, Cal.
 ●Waterman-Waterbury Co., Minneapolis, Minn.
 Western Blower Co., Seattle, Wash.

HEATERS, SCHOOL ROOM

- Agricola Furnace Co., Inc., Gadsden, Ala.
 ●American Foundry & Furnace Co., Bloomington, Ill.
 Barry Furnace Co., Hamilton, O.
 ●Brillion Furnace Co., Brillion, Wis.
 Campbell Heating Co., Des Moines, Ia.
 ●Chandler Co., Cedar Rapids, Ia.
 Corozone Air Conditioning Corp., Cleveland, O.
 Danville Stove & Mfg. Co., Danville, Pa.
 Des Moines Steel Furnace Co., Des Moines, Ia. (Oil).
 Detroit Michigan Stove Co., Detroit, Mich.
 Dowagiac Steel Furnace Co., Dowagiac, Mich.
 Edwards Furnace Co., Wellsboro, Pa.

- Estate Stove Co., Hamilton, O.
- Excelsior Stove & Mfg. Co., Quincy, Ill.
- Farris Furnace Co., Springfield, Ill.
- Floral City Co., Monroe, Mich.
- Fox Furnace Co., Elyria, O.
- Gem City Stove Co., Dayton, O.
- Harold Furnace Mfg. Co., Spokane, Wash.
- Hart & Crouse Co., Inc., Utica, N. Y.
- Hart Mfg. Co., Louisville, Ky. (Coal and Gas).
- Henry Furnace & Foundry Co., Cleveland, O.
- Home Stove Co., Indianapolis, Ind.
- International Heater Co., Utica, N. Y.
- Keith Furnace Co., Des Moines, Ia.
- Kelsey Heating Co., Syracuse, N. Y.
- Koons Furnace Co., Danville, Ill.
- Lennox Furnace Co., Marshalltown, Ia.
- Little Burner Co., Inc., H. C., San Rafael, Cal.
- MaGirl Foundry & Furnace Works, P. H., Bloomington, Ill.
- Maple City Furnace Co., Monmouth, Ill.
- Marshall Furnace Co., Marshall, Mich.
- Meyer Furnace Co., Peoria, Ill.
- Moncrief Furnace Co., Atlanta, Ga.
- Moore Corp., Joliet, Ill.
- Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- National Fan & Blower Corp., Chicago, Ill.
- Nelson Co., Detroit, Mich.
- Orbon Stove Co., Belleville, Ill.
- Patten Co., J. V., Sycamore, Ill.
- Payne Furnace & Supply Co., Beverly Hills, Cal.
- Perfection Stove Co., Cleveland, O.
- Pittston Stove Co., Pittston, Pa.
- Portland Stove Foundry Co., Portland, Me.
- Premier Furnace Co., Dowagiac, Mich.
- Rock Island Stove Co., Rock Island, Ill.
- Round Oak Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- St. Clair Foundry Corp., Centralia, Ill.
- Silent Sioux Oil Burner Corp., Orange City, Ia. (Oil).
- Standard Foundry & Furnace Co., DeKalb, Ill.
- Standard Furnace & Supply Co., Omaha, Nebr.
- Twentieth Century Heating & Ventilating Co., Akron, O.
- Waterman-Waterbury Co., Minneapolis, Minn.
- Western Blower Co., Seattle, Wash.
- Williamson Heater Co., Cincinnati, O.
- Wise Furnace Co., Akron, O.
- XXth Century Heating & Ventilating Co., Akron, O.

HEATING COILS

See Coils, Heating

HUMIDIFIER FITTINGS

See Fittings, Humidifier, Water Line

HUMIDIFIER VALVES

See Valves, Humidifier, Water Level

HUMIDIFIERS, FURNACE, EVAPORATION, AUTOMATIC

- Air Controls, Inc., Cleveland, O.
- American Foundry & Furnace Co., Bloomington, Ill.
- Automatic Humidifier Co., Cedar Falls, Ia.
- Bishop Humidifier Co., Detroit, Mich.
- Bryant Heater Co., Cleveland, O.
- Cary Mfg. Co., Waupaca, Wis.
- Chandler Co., Cedar Rapids, Ia.
- Clarm Mechanical Devices Co., Lima, O.
- Columbus Humidifier Co., Columbus, O.
- Des Moines Steel Furnace Co., Des Moines, Ia.
- Dowagiac Steel Furnace Co., Dowagiac, Mich.
- Electrogas Furnace & Mfg. Co., San Francisco, Cal.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Falstrom Co., Passaic, N. J.
- Fox Furnace Co., Elyria, O.
- Green Foundry & Furnace Works, Des Moines, Ia.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Health-O-Mist Humidifier Mfg. Co., Columbus, Wis.
- Henry Furnace & Foundry Co., Cleveland, O.
- Home Furnace Co., Holland, Mich.
- Hotentot Co., Inc., Omaha, Nebr.
- Humidity Headquarters, Cleveland, O.
- Hum-O-Zone Co., Horicon, Wis.
- Ideal Furnace Co., Detroit, Mich.
- Iowa Foundry Co., Sioux City, Ia.
- Johnson Gas Appliance Co., Cedar Rapids, Ia.
- Kleinalre Corp., Stevens Point, Wis.
- Kraker, Henry, Holland, Mich.
- Little Burner Co., Inc., H. C., San Rafael, Cal.
- Maid-O-Mist, Inc., Chicago, Ill.
- Marshall Furnace Co., Marshall, Mich.
- Meyer Furnace Co., Peoria, Ill.
- Monmouth Products Co., Cleveland, O.
- Mueller Furnace Co., L. J., Milwaukee, Wis.

- Pennsylvania Furnace & Iron Co., Warren, Pa.
- Perfect Burner Co., Lynn, Mass.
- Premier Furnace Co., Dowagiac, Mich.
- R-S Products Corp., Philadelphia, Pa.
- Richardson & Boynton Co., New York City.
- Roberts-Hamilton Co., Minneapolis, Minn.
- Rochester Mfg. Co., Inc., Rochester, N. Y.
- Round Oak Co., Dowagiac, Mich.
- Rudy Furnace Co., Dowagiac, Mich.
- Russell Electric Co., Chicago, Ill.
- Sallada Mfg. Co., Minneapolis, Minn.
- Security Stove & Mfg. Co., Kansas City, Mo.
- Skilbeck Mfg. Co., Kenosha, Wis.
- Skuttle Co., J. L., Detroit, Mich.
- Somers, Inc., H. J., Detroit, Mich.
- Thatcher Co., Newark, N. J.
- U. S. Pressed Steel Products Co., Kalamazoo, Mich.
- Universal Blower Co., Birmingham, Mich.
- Viking Air Conditioning Corp., Cleveland, O.
- Waterman-Waterbury Co., Minneapolis, Minn.
- Western Blower Co., Seattle, Wash.
- Wisconsin Humidifier Co., Milwaukee, Wis.
- Wise Furnace Co., Akron, O.

HUMIDIFIERS, FURNACE, SPRAY, AUTOMATIC

- American Foundry & Furnace Co., Bloomington, Ill.
- American Machine Products Co., Marshalltown, Ia.
- Binks Mfg. Co., Chicago, Ill.
- Bishop & Babcock Sales Co., Cleveland, O.
- Brundage Co., Kalamazoo, Mich.
- Bryant Corp., C. L., Cleveland, O.
- Bryant Heater Co., Cleveland, O.
- Electrogas Furnace & Mfg. Co., San Francisco, Cal.
- Fox Furnace Co., Elyria, O.
- Handelan Washed Air Co., Minneapolis, Minn.
- Lennox Furnace Co., Marshalltown, Ia.
- Meyer Furnace Co., Peoria, Ill.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Oil Burner Builders, Inc., Bellevue, Ia.
- Parks-Cramer Co., Fitchburg, Mass.
- Rega Mfg. Co., Rochester, N. Y.
- Research Corp., New York City.
- Russell Electric Co., Chicago, Ill.
- Somers, Inc., H. J., Detroit, Mich.
- Spray-Wheel Air Conditioners, Inc., Denver, Colo.
- Supreme Electric Products Corp., Rochester, N. Y.
- Thatcher Co., Newark, N. J.
- Thermal Units Mfg. Co., Chicago, Ill.
- United American Bosch Corp., Springfield, Mass.
- U. S. Air Conditioning Corp., Minneapolis, Minn.

HUMIDISTATS

- Automatic Products Co., Milwaukee, Wis.
- Barber-Colman Co., Rockford, Ill.
- Bristol Co., Waterbury, Conn.
- Detroit Lubricator Co., Detroit, Mich.
- Friez & Sons, Inc., Julien P., Baltimore, Md. (Human hair element)
- H-B Instrument Co., Inc., Philadelphia, Pa.
- Johnson Service Co., Milwaukee, Wis. (Hair, Membrane, Wood)
- Johnson Tool Co., Milwaukee, Wis.
- Lewis Air Conditioners, Inc., Minneapolis, Minn. (Hygroscopic paper element)
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn. (Human hair)
- Penn Electric Switch Co., Des Moines, Ia. (Parchment)
- Perfex Controls Co., Milwaukee, Wis.
- Ripley Co., W. R. Tacoma, Wash. (Flexing)
- Russell Electric Co., Chicago, Ill. (Wood)
- Spencer Thermostat Co., Attleboro, Mass.
- Standard Engineering Works, Pawtucket, R. I.

HUMIDITY CONTROLS

See Humidistats

HUMIDITY RECORDERS

See Recorders, Humidity

HYGROMETERS

- Bristol Co., Waterbury, Conn.
- Brown Instrument Co., Div. of Minneapolis-Honeywell Regulator Co., Philadelphia, Pa.
- Friez & Sons, Inc., Julien P., Baltimore, Md.
- Johnson Service Co., Milwaukee, Wis.
- Taylor Instrument Companies, Rochester, N. Y.

INDICATORS, SOUND LEVEL

- General Electric Co., Schenectady, N. Y.
- Johns-Manville, New York City.

INSULATION, BUILDING

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
 Alfol Insulation Co., New York City.
 Alton Mineral Wool Co., Alton, Ill.
 Aluminum Co. of America, Pittsburgh, Pa. (Aluminum foil)
 American Flange & Mfg. Co., Inc., New York City.
 Armstrong Cork Products Co., Lancaster, Pa. (Cork)
 Barrett Co., New York City. (Tar felt)
 Bird & Son, Inc., East Walpole, Mass.
 Cabot, Inc., Samuel, Boston, Mass.
 Carey Co., Philip, Lockland, Cincinnati, O.
 Celotex Corp., Chicago, Ill.
 Certain-teed Products Corp., New York City. (Rigid fibre)
 Cork Import Corp., New York City. (Corkboard)
 Cork Insulation Co., Inc., New York City. (Cork)
 Cornell Wood Products Co., Chicago, Ill.
 Eagle Picher Lead Co., Cincinnati, O. (Rockwool)
 Ehret Magnesia Mfg. Co., Valley Forge, Pa.
 General Insulating & Mfg. Co., Alexandria, Inc. (Blanket)
 Insulite Co., Minneapolis, Minn.
 Johns-Manville, New York City. (Rock wool, fibre board)
 Keasbey & Mattison Co., Ambler, Pa.
 Ludowici-Celadon Co., Chicago, Ill.
 Masonite Corp., Chicago, Ill.
 Mineral Felt Co., Toledo, O.
 Mineral Insulation Co., Chicago Ridge, Ill.
 Mundet Cork Corp., New York City. (Cork)
 National Gypsum Co., Buffalo, N. Y.
 Norristown Magnesia & Asbestos Co., Norristown, Pa.
 Owens-Illinois Glass Co., Toledo, O.
 Pacific Lumber Co., San Francisco, Cal. (Loose fill)
 Pacific States Felt & Mfg. Co., Inc., San Francisco, Cal.
 Reynolds Corp., New York City.
 Robertson Co., H. H., Pittsburgh, Pa.
 Rock Wool Products Co., Inc., Wabash, Ind.
 Ruberoid Co., New York City. (Rock wool)
 Smith & Kanzler, Inc., Elizabeth, N. J.
 Sprayo-Flake Co., Chicago, Ill.
 Standard Asbestos Mfg. Co., Chicago, Ill.
 Standard Lime & Stone Co., Baltimore, Md.
 Thermax Division, Northwest Magnesite Co., Pittsburgh, Pa.
 Therminsul Corp. of America, Kalamazoo, Mich.
 Truscon Steel Co., Youngstown, O.
 Union Fibre Co., Inc., Winona, Minn.
 United Cork Companies, Kearny, N. J.
 United States Gypsum Co., Chicago, Ill.
 U. S. Mineral Wool Co., New York City.
 Upson Co., Lockport, N. Y.
 Wilson, Inc., Grant, Chicago, Ill.
 Wilson & Co., Inc., Chicago, Ill. (Haircraft)
 Wood Conversion Co., St. Paul, Minn.
 Zonolite Corp. of Montana, Detroit, Mich.

INSULATION, DUCT

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
 Alfol Insulation Co., New York City.
 American Flange & Mfg. Co., Inc., New York City.
 American Hair & Felt Co., Chicago, Ill.
 Armstrong Cork Products Co., Lancaster, Pa.
 Cabot, Inc., Samuel, Boston, Mass.
 Carey Co., Philip, Cincinnati, O.
 Celotex Corp., Chicago, Ill.
 Cork Import Corp., New York City. (Corkboard)
 Cork Insulation Co., Inc., New York City. (Cork)
 Eagle-Picher Lead Co., Cincinnati, O. (Rockwool blankets)
 Ehret Magnesia Mfg. Co., Valley Forge, Pa.
 General Insulating & Mfg. Co., Alexandria, Ind.
 Insulite Co., Minneapolis, Minn.
 Johns-Manville, New York City. (Rock cork)
 Masonite Corp., Chicago, Ill.
 Mineral Felt Co., Toledo, O.
 Mineral Insulation Co., Chicago Ridge, Ill.
 Mundet Cork Corp., New York City. (Cork)
 Owens-Illinois Glass Co., Toledo, O.
 Presstite Engineering Co., St. Louis, Mo.
 Robertson Co., H. H., Pittsburgh, Pa.
 Rock Wool Products Co., Inc., Wabash, Ind.
 Ruberoid Co., New York City. (Asbestos cellular and laminated sheets)
 Sall Mountain Co., Chicago, Ill.
 Smith & Kanzler, Inc., Elizabeth, N. J.
 Sprayo-Flake Co., Chicago, Ill.
 Standard Asbestos Mfg. Co., Chicago, Ill.
 Thermax Division, Northwest Magnesite Co., Pittsburgh, Pa.
 Therminsul Corp. of America, Kalamazoo, Mich.
 Union Fibre Co., Inc., Winona, Minn.
 United Cork Companies, Kearny, N. J.
 Western Felt Works, Chicago, Ill.
 Wilson & Co., Inc., Chicago, Ill. (Hairbestos)
 Wilson, Inc., Grant, Chicago, Ill.
 Zonolite Corp. of Montana, Detroit, Mich.

INSULATION, FURNACE AND PIPE

Alfol Insulation Co., New York City.
 Carey Co., Philip, Lockland, Cincinnati, O.
 General Insulating & Mfg. Co., Alexandria, Ind. (Blanket)
 Eagle Picher Lead Co., Cincinnati, O. (Vercel Blocks)

Ehret Magnesia Mfg. Co., Valley Forge, Pa.
 Johns-Manville, New York City. (All types)
 Keasbey & Mattison Co., Ambler, Pa.
 Mineral Insulation Co., Chicago Ridge, Ill.
 Norristown Magnesia & Asbestos Co., Norristown, Pa.
 Rock Wool Products Co., Inc., Wabash, Ind. (Rock Wool)
 Ruberoid Co., New York City. (Asbestos & Magnesia)
 Smith & Kanzler, Inc., Elizabeth, N. J.
 Standard Asbestos Mfg. Co., Chicago, Ill.
 Standard Lime & Stone Co., Baltimore, Md.
 Therminsul Corp., Kalamazoo, Mich.
 Union Fibre Co., Inc., Winona, Minn.
 Wilson, Inc., Grant, Chicago, Ill.
 Zonolite Corp. of Montana, Detroit, Mich.

INSULATION, SOUND DEADENING, DUCT

American Hair & Felt Co., Chicago, Ill.
 Burgess Battery Co., Chicago, Ill.
 Cabot, Inc., Samuel, Boston, Mass.
 Carey Co., Philip, Cincinnati, O.
 Celotex Corp., Chicago, Ill.
 Cork Import Corp., New York City. (Corkboard)
 Cork Insulation Co., Inc., New York City. (Cork)
 Ehret Magnesia Mfg. Co., Valley Forge, Pa.
 Felters Co., Inc., Boston, Mass.
 Johns-Manville, New York City.
 Keasbey & Mattison Co., Ambler, Pa.
 Mineral Felt Co., Toledo, O.
 Mortell Co., J. W., Chicago, Ill.
 Presstite Engineering Co., St. Louis, Mo.
 Smith & Kanzler, Inc., Elizabeth, N. J.
 Sprayko-Flake Co., Chicago, Ill.
 Therminsul Corp., Kalamazoo, Mich.
 Western Felt Works, Chicago, Ill.
 Wilson, Inc., Grant, Chicago, Ill.
 Zonolite Corp. of Montana, Detroit, Mich.

LEADER STRAPS

See Fittings and Accessories, Conductor

LIFTS, SKYLIGHT

Danzer Metal Works, Inc., Hagerstown, Md.
 Dayton Greenhouse Mfg. Co., Dayton, O.
 Drummond Sheet Metal Works, Wichita, Kan.
 Hudson Equipment Corp., Minneapolis, Minn.
 Levow, David, New York City. (Gearing).
 Park City Cornice Works, Inc., Bridgeport, Conn.
 Schoedinger, F. O., Co., Columbus, O.
 Van Noorden Co., E., Boston, Mass.
 Weiss & Co., H., New York City.
 Willis Mfg. Co., Galesburg, Ill.

LININGS

See Refractories

LOUVRES AND SHUTTERS

• Airecon Industries, Detroit, Mich.
 Allen Corp., Detroit, Mich.
 American Coolair Corp., Jacksonville, Fla.
 • American Foundry & Furnace Co., Bloomington, Ill.
 American Sheet Metal Works, New Orleans, La.
 Ames Co., W. R., San Francisco, Cal.
 Andrews Lead Co., Inc., Long Island City, N. Y.
 Arex Co., Chicago, Ill.
 • Autovent Fan & Blower Co., Chicago, Ill.
 • Barber-Colman Co., Rockford, Ill.
 Bishop & Babcock Sales Co., Cleveland, O.
 • Buffalo Forge Co., Buffalo, N. Y.
 Burt Mfg. Co., Akron, O.
 Campbell Heating Co., E. K., Kansas City, Mo.
 Champion Blower & Forge Co., Lancaster, Pa.
 Chicago Metal Mfg. Co., Chicago, Ill.
 Clay Equipment Corp., Cedar Falls, Ia.
 Danzer Metal Works, Inc., Hagerstown, Md.
 Decatur Iron & Steel Co., Decatur, Ala.
 Diamond Mfg. Co., Wyoming, Pa.
 Drummond Sheet Metal Works, Wichita, Kan.
 Economy Electric Mfg. Co., Cicero, Ill.
 • Elgo Shutter & Mfg. Co., Detroit, Mich.
 Falstrom Co., Passaic, N. J.
 General Regulator Corp., Chicago, Ill.
 Gillian Mfg. Co., Detroit, Mich.
 Herrmann & Grace Co., Brooklyn, N. Y.
 Hirschman Co., Inc., W. F., Buffalo, N. Y.
 Jacobs Co., B. & J., Cincinnati, O.
 Jordan & Co., Paul R., Indianapolis, Ind.
 Kirk & Blum Mfg. Co., Cincinnati, O.
 Kleenaire Corp., Stevens Point, Wis.
 Lamb & Ritchie Co., Cambridge, Mass.
 Ledkote Products Co., Long Island City, N. Y.

- Martin Metal Mfg. Co., Wichita, Kan.
- Myers Electric Co., Pittsburgh, Pa.
- Perkinson & Brown, Chicago, Ill.
- Providence Cornice Co., Providence, R. I.
- Richmond Fireproof Door Co., Richmond, Ind.
- Robertson Co., H. H., Pittsburgh, Pa.
- Rynker Sheet Metal Works, Inc., Billings, Mont.
- Schoedinger Co., F. O., Columbus, O.
- Tiffin Art Metal Co., Tiffin, O.
- Tuttle & Bailey, Inc., New Britain, Conn.
- United States Register Co., Battle Creek, Mich.
- Van Noorden Co., E., Boston, Mass.
- Waterloo Register Co., Waterloo, Ia.
- White Co., Kelvin & Wilfred B., Boston, Mass.
- Willis Mfg. Co., Galesburg, Ill.
- York Corrugating Co., York, Pa.

MACHINERY, REBUILT AND USED

- Interstate Machinery Co., Inc., Chicago, Ill.
- Maplewood Machinery Co., Inc., Chicago, Ill.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Ward Machinery Co., Chicago, Ill.

MACHINES, CRIMPING

- Bertsch & Co., Cambridge City, Ind.
- Excelsior Tool and Machine Co., East St. Louis, Ill.
- Maplewood Machinery Co., Inc., Chicago, Ill.
- New Albany Machine Mfg. Co., New Albany, Ind.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Packham Crimper Co., Mechanicsburg, O.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Swaine Mfg. Co., Fred J., St. Louis, Mo.
- Yoder Co., Cleveland, O.

MACHINES, ELBOW

- Maplewood Machinery Co., Inc., Chicago, Ill.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Schatz Mfg. Co., Poughkeepsie, N. Y.

MACHINES, NIBBLING

- Hendley & Whittemore Co., Beloit, Wis.
- National Machine Tool Co., Racine, Wis.
- Pels & Co., Inc., Henry, New York City.
- Rock River Machine Co., Inc., Janesville, Wis.
- Savage Co., W. J., Knoxville, Tenn.
- Schatz Mfg. Co., Poughkeepsie, N. Y.

MACHINES, SEAMING

- Callahan Can Machine Co., Inc., Brooklyn, N. Y.
- Maplewood Machinery Co., Inc., Chicago, Ill.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Quickwork Co., St. Mary's, O.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Swaine Mfg. Co., Fred J., St. Louis, Mo.
- Ward Machinery Co., Chicago, Ill. (Flanging).
- Yoder Co., Cleveland, O.

MACHINES, SLITTING

- Bertsch & Co., Cambridge City, Ind.
- Callahan Can Machine Co., Inc., Brooklyn, N. Y.
- Hendley & Whittemore Co., Beloit, Wis.
- Maplewood Machinery Co., Inc., Chicago, Ill.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Quickwork Co., St. Mary's, O.
- Swaine Mfg. Co., Fred J., St. Louis, Mo.
- Yoder Co., Cleveland, O.

MACHINES, WIRING

- Callahan Can Machine Co., Inc., Brooklyn, N. Y.
- Cleveland Punch & Shear Works Co., Cleveland, O.
- Maplewood Machinery Co., Inc., Chicago, Ill.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Quickwork Co., St. Mary's, O.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Swaine Mfg. Co., Fred J., St. Louis, Mo.
- Yoder Co., Cleveland, O.

MAGNETIC SWITCHES

See Switches, Magnetic

METALS, PERFORATED, SHEET AND PLATE

- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Chicago Perforating Co., Chicago, Ill.
- Cross Engineering Co., Carbondale, Pa.
- Crucible Steel Co., of America, New York City.
- Diamond Mfg. Co., Wyoming, Pa.
- Erdle Perforating Co., Rochester, N. Y.

- Gillian Mfg. Co., Detroit, Mich.
- Hall Metal Products Co., Long Beach, Cal.
- Harrington & King Perforating Co., Chicago, Ill.
- Hendrick Mfg. Co., Carbondale, Pa.
- International Nickel Co., Inc., New York City (Monel Metal and Nickel)
- Johnston & Chapman Co., Chicago, Ill.
- Littleford Bros., Cincinnati, O.
- Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.
- Metalace Corp., South Boston, Mass.
- Mundt & Sons, Charles, Jersey City, N. J.
- Nortmann-Duffke Co., Milwaukee, Wis.
- Revere Copper & Brass, Inc., New York City.
- Standard Stamping & Perforating Co., Chicago, Ill.
- Western Wire & Iron Works, Inc., Chicago, Ill.
- Wickwire Spencer Steel Co., New York City.

METAL SPRAY GUNS

See Guns, Spray, Metals

METAL STAMPINGS

See Stampings, Metal

MOTORS, DAMPER, DUCT

- Automatic Products Co., Milwaukee, Wis.
- Barber-Colman Co., Rockford, Ill.
- Cook Electric Co., Chicago, Ill.
- Detroit Lubricator Co., Detroit, Mich.
- General Controls Co., San Francisco, Cal., and Cleveland, O.
- Janette Mfg. Co., Chicago, Ill.
- Mercoid Corp., Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Perfex Controls Co., Milwaukee, Wis.
- Russell Electric Co., Chicago, Ill.
- Sheer Co., H. M., Quincy, Ill.
- White Mfg. Co., St. Paul, Minn.

MOTORS, DAMPER, FURNACE DRAFT, ELECTRICAL

- Automatic Products Co., Milwaukee, Wis.
- Barber-Colman Co., Rockford, Ill.
- Cook Electric Co., Chicago, Ill.
- Detroit Lubricator Co., Detroit, Mich.
- General Controls Co., San Francisco, Cal., and Cleveland, O.
- Gleason-Avery, Inc., Auburn, N. Y.
- Mercoid Corp., Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Modern Heat Regulator Co., Cleveland, O.
- Perfex Controls Co., Milwaukee, Wis.
- Pioneer Heat Regulator Corp., Dayton, O.
- Russell Electric Co., Chicago, Ill.
- Sheer Co., H. M., Quincy, Ill.
- White Mfg. Co., St. Paul, Minn.

MOTORS, ELECTRIC, FRACTIONAL H. P.

- Allis Co., Louis, Milwaukee, Wis.
- Baldor Electric Co., St. Louis, Mo.
- Barber-Colman Co., Rockford, Ill. (A. C.)
- Black & Decker Mfg. Co., Towson, Md.
- Bodine Electric Co., Chicago, Ill.
- Brown-Brockmeyer Co., Inc., Dayton, O.
- Burke Electric Co., Erie, Pa.
- Century Electric Co., St. Louis, Mo.
- Continental Electric Co., Inc., Newark, N. J.
- Delco Products Corp., Dayton, O.
- Diehl Mfg. Co., Elizabethport, N. J.
- Duro Co., Dayton, O.
- Emerson Electric Mfg. Co., St. Louis, Mo.
- General Electric Co., Schenectady, N. Y.
- Harnischfeger Corp., Milwaukee, Wis.
- Holtzer-Cabot Electric Co., Boston, Mass.
- Howell Electric Motors Co., Howell, Mich.
- Imperial Electric Co., Akron, O.
- Janette Mfg. Co., Chicago, Ill.
- Leland Electric Co., Dayton, O.
- Marathon Electric Mfg. Corp., Wausau, Wis.
- Master Electric Co., Dayton, O.
- Ohio Electric Mfg. Co., Cleveland, O.
- Peerless Electric Co., Warren, O.
- Robbins & Myers, Inc., Springfield, O.
- Signal Electric Mfg. Co., Menominee, Mich.
- Speedway Mfg. Co., Cicero, Ill.
- Victor Electric Products, Inc., Cincinnati, O.
- Wagner Electric Corp., St. Louis, Mo.
- Westinghouse Electric & Mfg. Co., Mansfield, O.

MOTORS, ELECTRIC, 1 H. P. AND OVER

- Allis Co., Louis, Milwaukee, Wis.
- Allis-Chalmers Mfg. Co., Milwaukee, Wis.
- Baldor Electric Co., St. Louis, Mo.
- Brown-Brockmeyer Co., Inc., Dayton, O.
- Burke Electric Co., Erie, Pa.

- Century Electric Co., St. Louis, Mo.
- Continental Electric Co., Inc., Newark, N. J.
- Crocker-Wheeler Elec. Mfg. Co., Ampere, N. J.
- Delco Products Corp., Dayton, O.
- Diehl Mfg. Co., Elizabethport, N. J.
- Duro Co., Dayton, O.
- Emerson Electric Mfg. Co., St. Louis, Mo.
- Fairbanks, Morse & Co., Chicago, Ill.
- General Electric Co., Schenectady, N. Y.
- Harnischfeger Corp., Milwaukee, Wis.
- Holtzer-Cabot Electric Co., Boston, Mass.
- Howell Electric Motors Co., Howell, Mich.
- Ideal Electric & Mfg. Co., Mansfield, O.
- Imperial Electric Co., Akron, O.
- Janette Mfg. Co., Chicago, Ill.
- Leland Electric Co., Dayton, O.
- Lincoln Electric Co., Cleveland, O.
- Master Electric Co., Dayton, O.
- Peerless Electric Co., Warren, O.
- Reliance Electric & Engineering Co., Cleveland, O.
- Robbins & Myers, Inc., Springfield, O.
- Star Electric Motor Co., Bloomfield, N. J.
- Wagner Electric Corp., St. Louis, Mo.
- Westinghouse Electric & Mfg. Co., Mansfield, O.

MOULDING AND TRIM, ORNAMENTAL, for CABINETS and CASINGS

- Allmetal Weatherstrip Co., Chicago, Ill.
- Aluminum Co. of America, Pittsburgh, Pa.
- Brasco Mfg. Co., Harvey, Ill.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Empire Door Co., Inc., New York City.
- Falstrom Co., Passaic, N. J.
- Friedley-Voshardt Co., Chicago, Ill.
- Gillian Mfg. Co., Detroit, Mich.
- Herron-Zimmers Moulding Co., Detroit, Mich.
- Ledkote Products Co., Long Island City, N. Y.
- Mesker & Co., Geo. L., Evansville, Ind.
- Miller & Doing, Inc., Brooklyn, N. Y.
- Perrin Co., Edward C., Camden, N. J.

NAILS, ALUMINUM

- Aluminum Company of America, Pittsburgh, Pa.
- Hassall, Inc., John, Brooklyn, N. Y.
- Townsend Co., New Brighton, Pa.

NAILS, COPPER

- American Steel & Wire Co., Chicago, Ill.
- Angell Nail & Chaplet Co., Cleveland, O.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Columbia Steel Co., San Francisco, Cal.
- Copperweld Steel Co., Glassport, Pa.
- Hassall, Inc., John, Brooklyn, N. Y.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Maze Co., W. H., Peru, Ill.
- Royal Metal Products Co., Brooklyn, N. Y.
- Townsend Co., New Brighton, Pa.
- Turner & Seymour Mfg. Co., Torrington, Conn.

NAILS, HARDENED MASONRY

- American Steel Co., Pittsburgh, Pa.
- American Steel & Wire Co., Chicago, Ill.
- Townsend Co., New Brighton, Pa.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Steel Corp., Wheeling, W. Va.

NAILS, ROOFING

- American Steel & Wire Co., Chicago, Ill.
- Angell Nail & Chaplet Co., Cleveland, O.
- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Bethlehem Steel Co., Bethlehem, Pa.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Columbia Steel Co., San Francisco, Cal.
- Continental Steel Corp., Kokomo, Ind.
- Deniston Co., Chicago, Ill.
- Dickson Weatherproof Nail Co., Evanston, Ill. (Lead Headed)
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Gulf States Steel Co., Birmingham, Ala.
- Hassall, Inc., John, Brooklyn, N. Y.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Jones & Laughlin Steel Corp., Pittsburgh, Pa.
- Malleable Iron Fittings Co., Branford, Conn.
- Maze Co., W. H., Peru, Ill.
- National Lead Co., New York City.
- Republic Steel Corp., Cleveland, O.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Townsend Co., New Brighton, Pa.
- Turner & Seymour Mfg. Co., Torrington, Conn.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Steel Corp., Wheeling, W. Va.
- Youngstown Sheet & Tube Co., Youngstown, O.

NAILS, SCREW, HARDENED

- National Screw & Mfg. Co., Cleveland, O.
- Parker-Kalon Corp., New York City.
- Republic Steel Corp., Cleveland, O.
- Townsend Co., New Brighton, Pa.

NAILS, STAINLESS STEEL

- Anti-Corrosive Metal Products Co., Inc., Castleton-on-Hudson, N. Y.
- Republic Steel Corp., Cleveland, O.
- Turner & Seymour Mfg. Co., Torrington, Conn.

NAILS, ZINC COATED

- American Steel & Wire Co., Chicago, Ill.
- American Zinc Products Co., Greencastle, Ind.
- Angell Nail & Chaplet Co., Cleveland, O.
- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Bethlehem Steel Co., Bethlehem, Pa.
- Columbia Steel Co., San Francisco, Cal.
- Continental Steel Corp., Kokomo, Ind.
- Gulf States Steel Co., Birmingham, Ala.
- Hassall, Inc., John, Brooklyn, N. Y.
- Jones & Laughlin Steel Corp., Pittsburgh, Pa.
- Malleable Iron Fittings Co., Branford, Conn.
- Maze Co., W. H., Peru, Ill.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (Galvanized)
- Townsend Co., New Brighton, Pa.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Steel Corp., Wheeling, W. Va.
- Youngstown Sheet & Tube Co., Youngstown, O.

NIGHT AIR FANS

See Fans, Night Air Cooling

NOZZLES, SPRAY

- Balloffett Dies & Nozzle Co., Inc., Guttenberg, N. J.
- Binks Mfg. Co., Chicago, Ill.
- Bishop & Babcock Sales Co., Cleveland, O.
- Buffalo Forge Co., Buffalo, N. Y.
- Detroit Lubricator Co., Detroit, Mich.
- Friez & Sons, Inc., Julien P., Baltimore, Md.
- Grinnell Co., Inc., Providence, R. I.
- Howell Mfg. Co., Kansas City, Mo.
- Hubbard Co., Minneapolis, Minn.
- Johnson Tool Co., Inc., East Providence, R. I.
- Marley Co., Kansas City, Mo.
- Martocello & Co., Jos. A., Philadelphia, Pa.
- Monarch Mfg. Works, Inc., Philadelphia, Pa.
- Peterson Freezem Mfg. Co., Kansas City, Mo.
- Rega Mfg. Co., Rochester, N. Y.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Supreme Electric Products Corp., Rochester, N. Y.
- Trane Co., LaCrosse, Wis.

OFFSETS, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

OIL BURNER CONTROLS

See Controls, Oil Burner

OIL BURNERS

See Burners, Oil

OZONIZERS

- Corozone Air Conditioning Corp., Cleveland, O.
- Electroaire Corp., Chicago, Ill.
- Montgomery Bros., San Francisco, Cal.
- Russell Electric Co., Chicago, Ill.
- Triox Engineering Co., St. Louis, Mo.

PAINT, ALUMINUM

- Acme Refining Co., Cleveland, O.
- Aluminum Company of America, Pittsburgh, Pa.
- Asphalt Products Co., Syracuse, N. Y.
- Calbar Paint & Varnish Co., Philadelphia, Pa.
- Carter Paint Co., Liberty, Ind.
- Certain-teed Products Corp., New York City.
- Connors Paint Mfg. Co., Wm., Troy, N. Y.
- Continental Products Co., Euclid, O.
- Cork Import Corp., New York City.
- Glidden Co., Cleveland, O.
- Hague & Co., Inc., Alfred, Brooklyn, N. Y.

Heath & Milligan Mfg. Co. Div. of Glidden Co., Chicago, Ill.

Horn Co., A. C., Long Island City, N. Y.
Iowa Paint Mfg. Co., Des Moines, Ia.
Koppers Products Co., Pittsburgh, Pa.
Lastik Products Co., Inc., Pittsburgh, Pa.
National Mfg. Corp., Tonawanda, N. Y.
Ohmlac Paint & Refining Co., Chicago, Ill.
●Pyrolite Products Co., Cleveland, O.
Reynolds Corp., New York City.
Roxalin Flexible Lacquer Co., Elizabeth, N. J.
Technical Coatings, Inc., New York City.
Thompson & Co., Pittsburgh, Pa.
Tropical Paint & Oil Co., Cleveland, O.
Wilhelm Co., A., Reading, Pa.

PAINT, ASBESTOS

Barber Co., Inc., Philadelphia, Pa.
Calbar Paint & Varnish Co., Philadelphia, Pa.
Carter Paint Co., Liberty, Ind.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Flintkote Co., New York City.
Glidden Co., Cleveland, O.
Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago, Ill.

Hetzel Roofing Products Co., Newark, N. J.
Horn Co., A. C., Long Island City, N. Y.
Iowa Paint Mfg. Co., Des Moines, Ia.
Lastik Products Co., Inc., Pittsburgh, Pa.
Metropolitan Refining Co., Long Island City, N. Y.
National Mfg. Corp., Tonawanda, N. Y.
Ohmlac Paint & Refining Co., Chicago, Ill.
●Pyrolite Products Co., Cleveland, O.
Ruberoid Co., New York City.
Sauerisen Cements Co., Sharpsburg, Pa.
Tamm's Silica Co., Chicago, Ill.
Thompson & Co., Pittsburgh, Pa.
Tropical Paint & Oil Co., Cleveland, O.
Wilhelm Co., A., Reading, Pa.
Wilson, Inc., Grant, Chicago, Ill.

PAINT, CONCRETE, WATERPROOFING

Acme Refining Co., Cleveland, O.
Asphalt Products Co., Syracuse, N. Y.
Barber Co., Inc., Philadelphia, Pa.
Barrett Co., New York City.
Cabot, Inc., Samuel, Boston, Mass.
Calbar Paint & Varnish Co., Philadelphia, Pa.
Certain-teed Products Corp., New York City.
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Flintkote Co., New York City.
Glidden Co., Cleveland, O.
Goodrich Co., B. F., Akron, O.
Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago, Ill.

Horn Co., A. C., Long Island City, N. Y.
Iowa Paint Mfg. Co., Des Moines, Ia.
Koppers Products Co., Pittsburgh, Pa.
Lastik Products Co., Inc., Pittsburgh, Pa.
Metropolitan Refining Co., Long Island City, N. Y.
Ohmlac Paint & Refining Co., Chicago, Ill.
Pecora Paint Co., Philadelphia, Pa.
●Pyrolite Products Co., Cleveland, O.
Ruberoid Co., New York City.
Tamm's Silica Co., Chicago, Ill.
Thompson & Co., Pittsburgh, Pa.
Tropical Paint & Oil Co., Cleveland, O.
Truscon Laboratories, Detroit, Mich.
United States Gypsum Co., Chicago, Ill.
Wilhelm Co., A., Reading, Pa.

PAINT, COPPER

American Coppercote, Inc., New York City.

PAINT, CRACKLE FINISH

Glidden Co., Cleveland, O.
Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago, Ill.
Iowa Paint Mfg. Co., Des Moines, Ia.
Roxalin Flexible Lacquer Co., Elizabeth, N. J.
Tropical Paint & Oil Co., Cleveland, O.
●Wattenamel Co., Summit, Ill.
Wilhelm Co., A., Reading, Pa.
Zapon-Brevolite Lacquer Co., North Chicago, Ill.

PAINT, HOT SURFACES

Acme Refining Co., Cleveland, O.
American Chemical Paint Co., Ambler, Pa.

Barrett Co., New York City.
Cabot, Inc., Samuel, Boston, Mass.
Calbar Paint & Varnish Co., Philadelphia, Pa.
Carey Co., Philip, Lockland, Cincinnati, O.
Carter Paint Co., Liberty, Ind.
Certain-teed Products Corp., New York City.
Continental Products Co., Euclid, O.
Glidden Co., Cleveland, O.
Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Heath & Milligan Mfg. Co., Div. of Glidden Co., Chicago, Ill.

Hetzel Roofing Products Co., Newark, N. J.
Horn Co., A. C., Long Island City, N. Y.
Iowa Paint Mfg. Co., Des Moines, Ia.
●Laclede-Christy Clay Products Co., St. Louis, Mo.
Metropolitan Refining Co., Long Island City, N. Y.
National Mfg. Corp., Tonawanda, N. Y.
Ohmlac Paint & Refining Co., Chicago, Ill.
●Pyrolite Products Co., Cleveland, O.
Roxalin Flexible Lacquer Co., Elizabeth, N. J.
Sauerisen Cements Co., Sharpsburg, Pa.
Technical Coatings, Inc., New York City.
Thompson & Co., Pittsburgh, Pa.
Tropical Paint & Oil Co., Cleveland, O.
●Walsh Refractories Corp., St. Louis, Mo.
Wilhelm Co., A., Reading, Pa.

PAINT, ROOFING

Acme Refining Co., Cleveland, O.
Asphalt Products Co., Syracuse, N. Y.
Barber Co., Inc., Philadelphia, Pa. (Asphalt).
Barrett Co., New York City. (Pitch).
Bird & Son, Inc., East Walpole, Mass.
Cabot, Inc., Samuel, Boston, Mass.
Calbar Paint & Varnish Co., Philadelphia, Pa.
Carey Co., Philip, Lockland, Cincinnati, O.
Certain-teed Products Corp., New York City.
Clinton Metallic Paint Co., Clinton, N. Y. (Red Metallic and Venetian).
Continental Products Co., Euclid, O. (All kinds).
Glidden Co., Cleveland, O.
Heath & Milligan Mfg. Co., Division of Glidden Co., Chicago, Ill. (All kinds).
Horn Co., A. C., Long Island City, N. Y.
Iowa Paint Mfg. Co., Des Moines, Ia. (Asphalt).
Koppers Products Co., Pittsburgh, Pa. (Bituminous).
Lastik Products Co., Inc., Pittsburgh, Pa. (Asphalt, Tar).
Ohmlac Paint & Refining Co., Chicago, Ill. (Asphalt).
Pecora Paint Co., Philadelphia, Pa.
●Pyrolite Products Co., Cleveland, O. (Asbestos, Asphalt and Tar).
Ruberoid Co., New York City. (Asphalt and Tar).
Rutland Fire Clay Co., Rutland, Vt. (Asphalt).
Thompson & Co., Pittsburgh, Pa.
Wilhelm Co., A., Reading, Pa.

PAINT SPRAY GUNS

See Guns, Spray, Paint

PAPER, ASBESTOS

Carey Co., Philip, Lockland, Cincinnati, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Johns-Manville, New York City.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Cal.
Ruberoid Co., New York City.
Sall Mountain Co., Chicago, Ill.
Smith & Kantzler, Inc., Elizabeth, N. J.
Standard Asbestos Mfg. Co., Chicago, Ill.
Wilson, Inc., Grant, Chicago, Ill.

PASTE, ASBESTOS PAPER

Clark Stek-O Corp., Rochester, N. Y.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Keasbey & Mattison Co., Ambler, Pa.
●Meyer & Bro. Co., F., Peoria, Ill.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Ruberoid Co., New York City.
Rutland Fire Clay Co., Rutland, Vt.
Sall Mountain Co., Chicago, Ill.
Smith & Kantzler, Inc., Elizabeth, N. J.
Standard Asbestos Mfg. Co., Chicago, Ill.
Wilson, Inc., Grant, Chicago, Ill.

PERFORATED METALS

See Metals, Perforated, Sheet and Plate

PIPE, CONDUCTOR

Ames Co., W. R., San Francisco, Cal.
Barnes Metal Products Co., Chicago, Ill.

- Berger Bros. Co., Philadelphia, Pa.
- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Braden Mfg. Co., Terre Haute, Ind.
- Budke Stamping Co., Canonsburg, Pa.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Danzer Metal Works, Inc., Hagerstown, Md.
- Decatur Iron & Steel Co., Decatur, Ala.
- Downs-Smith Brass & Copper Co., Long Island City, N. Y.
- Hussey & Co., C. G., Pittsburgh, Pa. (Copper)
- La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- Lamb & Ritchie Co., Cambridge, Mass.
- Lyon, Conklin & Co., Inc., Baltimore, Md.
- Martin Metal Mfg. Co., Wichita, Kan.
- Milcor Steel Co., Milwaukee, Wis.
- Miller & Doing, Inc., Brooklyn, N. Y.
- New Delphos Mfg. Co., Delphos, O.
- Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Providence Cornice Co., Providence, R. I.
- Reeves Mfg. Co., Dover, O.
- Schoedinger Co., F. O., Columbus, O.
- Sheet Metal Products Co., Peoria, Ill.
- Southbridge Roofing Co., Inc., Southbridge, Mass.
- Southern States Iron Roofing Co., Savannah, Ga.
- Tiffin Art Metal Co., Tiffin, O.
- Watson Co., Inc., Jas. H., Bradley, Ill.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Woolwine Metal Products Co., Los Angeles, Cal.
- York Corrugating Co., York, Pa.

PIPE, FURNACE

- Acer & Whedon, Inc., Medina, N. Y.
- Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.
- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Braden Mfg. Co., Terre Haute, Ind.
- Budke Stamping Co., Canonsburg, Pa.
- Chicago Furnace Supply Co., Chicago, Ill.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Cincinnati Stamping Co., Cincinnati, O.
- Danzer Metal Works, Inc., Hagerstown, Md.
- Detroit Safety Furnace Pipe Co., Detroit, Mich.
- Edwards Furnace Co., Wellsboro, Pa.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Excelsior Stove & Mfg. Co., Quincy, Ill.
- Gray Metal Products, Inc., Rochester, N. Y.
- Green Foundry & Furnace Works, Des Moines, Ia.
- Henry Furnace & Foundry Co., Cleveland, O.
- Home Furnace Co., Holland, Mich.
- Howes Co., S. M., Charlestown, Boston, Mass.
- International Heater Co., Utica, N. Y.
- La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- Lamneck Products, Inc., Columbus, O.
- Lennox Furnace Co., Marshalltown, Ia.
- Majestic Co., Huntington, Ind.
- Maple City Furnace Co., Monmouth, Ill.
- Martin Bros., Rochester, N. Y.
- Martin Metal Mfg. Co., Wichita, Kan.
- Meyer & Bro. Co., F., Peoria, Ill.
- Milcor Steel Co., Milwaukee, Wis.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Parkersburg Iron & Steel Co., Parkersburg, W. Va.
- Payne Furnace & Supply Co., Beverly Hills, Cal.
- Peerless Foundry Co., Indianapolis, Ind.
- Phillips Heating, Ventilating & Mfg. Co., Los Angeles, Cal.
- Providence Cornice Co., Providence, R. I.
- Reeves Mfg. Co., Dover, O.
- Roberts-Hamilton Co., Minneapolis, Minn.
- Schoedinger Co., F. O., Columbus, O.
- Standard Furnace & Supply Co., Omaha, Nebr.
- Tiffin Art Metal Co., Tiffin, O.
- United States Register Co., Battle Creek, Mich.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wilder Metal Co., Niles, O.
- Williamson Heater Co., Cincinnati, O.

PIPE, SMOKE

- Acer & Whedon, Inc., Medina, N. Y.
- Acme Tin Plate & Roofing Supply Co., Philadelphia, Pa.
- Alrtherm Mfg. Co., St. Louis, Mo.
- Allegheny Steel Co., Brackenridge, Pa.
- Berger Co., L. D., Philadelphia, Pa.
- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Braden Mfg. Co., Terre Haute, Ind.
- Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
- Budke Stamping Co., Canonsburg, Pa.
- Campbell Heating Co., Des Moines, Ia.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Cincinnati Stamping Co., Cincinnati, O.
- Danzer Metal Works, Inc., Hagerstown, Md.
- Detroit Safety Furnace Pipe Co., Detroit, Mich.
- Edwards Furnace Co., Wellsboro, Pa.

- Excelsior Steel Furnace Co., Chicago, Ill.
- Excelsior Stove & Mfg. Co., Quincy, Ill.
- Faultless Castings Co., Greencastle, Ind. (Cast Iron)
- Galva Heater Co., Galva, Ill. (Cast Iron)
- Green Foundry & Furnace Works, Des Moines, Ia.
- Henry Furnace & Foundry Co., Cleveland, O.
- Home Furnace Co., Holland, Mich.
- Howes Co., S. M., Charlestown, Boston, Mass.
- International Heater Co., Utica, N. Y.
- La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- Lamneck Products, Inc., Columbus, O.
- Lennox Furnace Co., Marshalltown, Ia.
- Majestic Co., Huntington, Ind.
- Martin Bros., Rochester, N. Y.
- Martin Metal Mfg. Co., Wichita, Kan.
- Meyer & Bro. Co., F., Peoria, Ill.
- Milcor Steel Co., Milwaukee, Wis.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Parkersburg Iron & Steel Co., Parkersburg, W. Va.
- Patten Co., J. V., Sycamore, Ill.
- Peerless Foundry Co., Indianapolis, Ind.
- Phillips Heating, Ventilating & Mfg. Co., Los Angeles, Cal.
- Providence Cornice Co., Providence, R. I.
- Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
- Reeves Mfg. Co., Dover, O.
- Roberts-Hamilton Co., Minneapolis, Minn.
- Rudy Furnace Co., Dowagiac, Mich.
- Schoedinger Co., F. O., Columbus, O.
- Standard Furnace & Supply Co., Omaha, Nebr.
- Sterling Foundry Co., Sterling, Ill. (Cast Iron)
- Ster-Na-Man Foundry Co., Springfield, Ill. (Cast Iron)
- Tiffin Art Metal Co., Tiffin, O.
- United States Register Co., Battle Creek, Mich.
- Waterloo Register Co., Waterloo, Ia. (Cast Iron)
- Williamson Heater Co., Cincinnati, O.
- Wise Furnace Co., Akron, O.

PIPE, STOVE

- Acer & Whedon, Inc., Medina, N. Y.
- Acme Tin Plate & Roofing Co., Philadelphia, Pa.
- Berger Co., L. D., Philadelphia, Pa.
- Budke Stamping Co., Canonsburg, Pa.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Decatur Iron & Steel Co., Decatur, Ala.
- Eclipse Metal Mfg. Co., Eden, N. Y.
- Excelsior Steel Furnace Co., Chicago, Ill.
- Excelsior Stove & Mfg. Co., Quincy, Ill.
- Howes Co., S. M., Charlestown, Boston, Mass.
- Martin Bros., Rochester, N. Y.
- Milcor Steel Co., Milwaukee, Wis.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Peerless Foundry Co., Indianapolis, Ind.
- Providence Cornice Co., Providence, R. I.
- Reeves Mfg. Co., Dover, O.
- Schoedinger Co., F. O., Columbus, O.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wilder Metal Co., Niles, O.

PIPE, INSULATION

See Insulation, Furnace and Pipe

PIPELESS FURNACES

See Furnaces, Warm Air, Pipeless

PIPE AND FITTINGS, SHEET METAL

See Ducts and Fittings, Prefabricated

PLATE, BEARING, STUDDING SPACE

Adjustable Bearing Plate Co., St. Louis, Mo.

PLATES, ALLOY

- Allegheny Steel Co., Brackenridge, Pa.
- Aluminum Company of America, Pittsburgh, Pa. (Aluminum)
- American Brass Co., Waterbury, Conn. (All copper alloys)
- American Rolling Mill Co., Middletown, O. (Stainless steel)
- Bethlehem Steel Co., Bethlehem, Pa.
- Crucible Steel Co. of America, New York City.
- Gulf States Steel Co., Birmingham, Ala. (Copper, Steel)
- Lukens Steel Co., Coatesville, Pa.
- Republic Steel Corp., Cleveland, O. (Light gauge steel)
- Ryerson & Son, Inc., Jos. T., Chicago, Ill.
- Youngstown Sheet & Tube Co., Youngstown, O.

PLATES, STEEL

- American Rolling Mill Co., Middletown, O.
- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie-Illinois Steel Co., Pittsburgh, Pa.

Crucible Steel Co. of America, New York City.
 Decatur Iron & Steel Co., Decatur, Ala.
 Granite City Steel Co., Granite City, Ill.
 Gulf States Steel Co., Birmingham, Ala.
 Ingersoll Steel & Disc Co., Chicago, Ill.
 Inland Steel Co., Chicago, Ill.
 International Steel Co., Evansville, Ind.
 Jones & Laughlin Steel Corp., Pittsburgh, Pa.
 Lukens Steel Co., Coatesville, Pa.
 Otis Steel Co., Cleveland, O.
 ● Republic Steel Corp., Cleveland, O.
 ● Ryerson & Son, Inc., Jos. T., Chicago, Ill.
 Wood Steel Co., Alan, Conshohocken, Pa.
 ● Youngstown Sheet & Tube Co., Youngstown, O.

PLATES, WROUGHT IRON

Byers Co., A. M., Pittsburgh, Pa.
 Reading Iron Co., Reading, Pa.

PREFRABRICATED DUCTS

See Ducts and Fittings, Prefabricated

PRESSES AND DIES

Bertsch & Co., Cambridge City, Ind.
 Bliss Co., E. W., Toledo, O.
 Callahan Can Machine Co., Inc., Brooklyn, N. Y.
 Cleveland Punch & Shear Works Co., Cleveland, O.
 ● Dreis & Krump Mfg. Co., Chicago, Ill.
 Grand Rapids Die & Tool Co., Grand Rapids, Mich.
 Henry & Wright Mfg. Co., Hartford, Conn.
 ● Marshalltown Mfg. Co., Marshalltown, Ia.
 McGee-Parry Machine Wks., Salt Lake City, Utah.
 Minster Machine Co., Minster, O.
 New Albany Machine Mfg. Co., New Albany, Ind.
 ● Niagara Machine & Tool Works, Buffalo, N. Y.
 ● Peck, Stow & Wilcox Co., Southington, Conn.
 Perkins Machine Co., Warren, Mass.
 Schatz Mfg. Co., Poughkeepsie, N. Y.
 Spun Steel Corp., Canton, O.
 Zeh & Hahnemann Co., Newark, N. J.

PRESSURE REGULATING VALVES, GAS

See Valves, Gas Pressure Regulating

PROTECTORS, DOWNSPOUT

See Fittings and Accessories, Conductor

PSYCHROMETERS

Bristol Co., Waterbury, Conn.
 Brown Instrument Co., Div. Minneapolis-Honeywell Regulator Co., Philadelphia, Pa.
 ● Friez & Sons, Inc., Julien P., Baltimore, Md.
 Moeller Instrument Co., Brooklyn, N. Y.
 H-B Instrument Co., Inc., Philadelphia, Pa.
 Hill Co., Chicago, Ill.
 Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.
 Taylor Instrument Companies, Rochester, N. Y.

PULLEYS, FAN AND MOTOR

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
 American Pulley Co., Philadelphia, Pa.
 Chicago Die Casting Co., Chicago, Ill.
 ● Congress Tool & Die Co., Detroit, Mich.
 Dick Co., Inc., R. & J., Passaic, N. J.
 Dodge Mfg. Corp., Mishawaka, Ind.
 Duro Metal Products Co., Chicago, Ill.
 Goldens' Fdry. & Mach. Co., Columbus, Ga.
 Horton Mfg. Co., Minneapolis, Minn.
 Jones Fdry. & Mach. Co., W. A., Chicago, Ill.
 ● Maurey Mfg. Corp., Chicago, Ill.
 McGee-Parry Machine Wks., Salt Lake City, Utah.
 Medart Co., St. Louis, Mo.
 Moloch Fdry. & Mach. Co., Kaukauna, Wis.
 Ohio Valley Pulley Wks., Maysville, Ky.
 Pyott Fdry. & Mach. Co., Chicago, Ill.
 Rockwood Mfg. Co., Indianapolis, Ind.
 Rosedale Fdry. & Mach. Co., N. S., Pittsburgh, Pa.
 Smith, Inc., Winfield H., Springfield, N. Y.
 Spun Steel Corp., Canton, O.
 Steel and Tubes, Inc., Cleveland, O. (Stamping)
 Wood's Sons Co., T. B., Chambersburg, Pa.

PULLEYS, FURNACE

● American Foundry & Furnace Co., Bloomington, Ill.
 ● Hart & Cooley Mfg. Co., Chicago, Ill.
 ● Mueller Furnace Co., L. J., Milwaukee, Wis.
 Rosedale Fdry. & Mach. Co., N. S., Pittsburgh, Pa.
 Stover Mfg. & Engine Co., Freeport, Ill.
 ● United States Register Co., Battle Creek, Mich.

PUMPS, DEEP-WELL

American Steam Pump Co., Battle Creek, Mich.
 ● Chandler Co., Cedar Rapids, Ia.
 Crane Co., Chicago, Ill.
 Dayton Pump & Mfg. Co., Dayton, O.
 Decatur Pump Co., Decatur, Ill.
 Deming Co., Salem, O.
 Fairbanks, Morse & Co., Chicago, Ill.
 Goulds Pumps, Inc., Seneca Falls, N. Y.
 Heil Co., Milwaukee, Wis.
 Meier Electric & Machine Co., Indianapolis, Ind.
 Micro-Westco, Inc., Bettendorf, Ia.
 Myers & Bro. Co., F. E., Ashland, O.
 Pomona Pump Co., Pomona, Cal.
 Red Jacket Mfg. Co., Davenport, Ia.
 Roper Corp., Geo. D., Rockford, Ill.
 Union Steam Pump Co., Battle Creek, Mich.
 Uniflow Mfg. Co., Erie, Pa.
 United Motors Service, Detroit, Mich.
 Victor Equipment Co., Los Angeles, Cal.
 Worthington Pump & Machinery Corp., Harrison, N. J.

PUMPS, SHALLOW-WELL

● Chandler Co., Cedar Rapids, Ia.
 Crane Co., Chicago, Ill.
 Dayton Pump & Mfg. Co., Dayton, O.
 Decatur Pump Co., Decatur, Ill.
 Deming Co., Salem, O.
 Fairbanks, Morse & Co., Chicago, Ill.
 Goulds Pumps, Inc., Seneca Falls, N. Y.
 Heil Co., Milwaukee, Wis.
 Meier Electric & Machine Co., Indianapolis, Ind.
 Micro-Westco, Inc., Bettendorf, Ia.
 Morris Machine Works, Baldwinsville, N. Y.
 Myers & Bro. Co., F. E., Ashland, Ohio.
 Roots-Connersville Blower Corp., Connersville, Ind.
 Roper Corp., Geo. D., Rockford, Ill.
 Uniflow Mfg. Co., Erie, Pa.
 United Motors Service, Detroit, Mich.
 Victor Equipment Co., Los Angeles, Cal.
 Viking Pump Co., Cedar Falls, Ia.
 Worthington Pump & Machinery Corp., Harrison, N. J.

PUMPS, WATER CIRCULATING

Aldrich Pump Co., Allentown, Pa.
 Allis-Chalmers Mfg. Co., Milwaukee, Wis.
 American Steam Pump Co., Battle Creek, Mich.
 Bell & Gossett, Chicago, Ill.
 Buffalo Pumps, Inc., Buffalo, N. Y.
 Chicago Pump Co., Chicago, Ill.
 Decatur Pump Co., Decatur, Ill.
 Deming Co., Salem, O.
 De Laval Steam Turbine Co., Trenton, N. J.
 Economy Pumping Machinery Co., Inc., Chicago, Ill.
 Fairbanks, Morse & Co., Chicago, Ill.
 Frederick Iron & Steel Co., Frederick, Md.
 General Blower Co., Philadelphia, Pa.
 Goulds Pumps, Inc., Seneca Falls, N. Y.
 Ingersoll-Rand, New York City.
 Janette Mfg. Co., Chicago, Ill.
 Lecourtenay Co., Newark, N. J.
 Lewis & Co., Inc., Chas. S., St. Louis, Mo.
 Micro-Westco, Inc., Bettendorf, Ia.
 Morris Machine Works, Baldwinsville, N. Y.
 Myers & Bro. Co., F. E., Ashland, O.
 Nash Engineering Co., South Norwalk, Conn.
 National Steam Pump Co., Upper Sandusky, O.
 Palmer Electric Co., Detroit, Mich.
 Quimby Pump Co., Inc., Newark, N. J.
 Rock River Machine Co., Inc., Janesville, Wis.
 Roots-Connersville Blower Corp., Connersville, Ind.
 Roper Corp., Geo. D., Rockford, Ill.
 Schwitzer-Cummins Co., Indianapolis, Ind.
 Swaby Mfg. Co., Chicago, Ill.
 Taber Pump Co., Buffalo, N. Y.
 Taco Heaters, Inc., New York City.
 Trimount Rotary Power Co., East Dedham, Mass.
 Uniflow Mfg. Co., Erie, Pa.
 Union Steam Pump Co., Battle Creek, Mich.
 Victor Equipment Co., Los Angeles, Cal.
 Viking Pump Co., Cedar Falls, Ia.
 Watts Regulator Co., Lawrence, Mass.
 Weinman Pump Co., Columbus, O.
 Worthington Pump & Machinery Corp., Harrison, N. J.
 Yeomans Bros. Co., Chicago, Ill.

PUNCHES AND SHEARS COMBINED

● Allsteel Press Co., Inc., Chicago, Ill.
 Armstrong-Blum Mfg. Co., Chicago, Ill.
 Beatty Machine & Mfg. Co., Hammond, Ind.
 Bertsch & Co., Cambridge City, Ind.
 ● Buffalo Forge Co., Buffalo, N. Y.
 Cleveland Punch & Shear Works Co., Cleveland, O.
 Excelsior Tool & Machine Co., East St. Louis, Ill.

● Advertisement in this issue. See Index to Advertisers, page 188, and Part 1

- G.D.S. Shearing & Punching Machine Co., New York City.
- Heartley Machine & Tool Co., Toledo, O.
- Hendley & Whittemore Co., Beloit, Wis.
- Kidder Mfg. Co., Inc., J. F. Burlington, Vt.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Pels & Co., Inc., Henry, New York City.
- Rock River Machine Co., Inc., Janesville, Wis.
- Schatz Mfg. Co., Poughkeepsie, N. Y.

PUNCHES, BENCH

- Allsteel Press Co., Inc., Chicago, Ill.
- Armstrong-Blum Mfg. Co., Chicago, Ill.
- Buffalo Forge Co., Buffalo, N. Y.
- Champion Blower & Forge Co., Lancaster, Pa.
- Clough, A. W., Meriden, Conn.
- Excelsior Tool and Machine Co., East St. Louis, Ill.
- Heartley Machine & Tool Co., Toledo, O.
- Hendley & Whittemore Co., Beloit, Wis.
- Kidder Mfg. Co., Inc., J. F. Burlington, Vt.
- New Albany Machine Mfg. Co., New Albany, Ind.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Rock River Machine Co., Inc., Janesville, Wis.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Whitney Mfg. Co., W. A., Rockford, Ill.
- Whitney Metal Tool Co., Rockford, Ill.

PUNCHES, COMBINATION HAND AND BENCH

- Allsteel Press Co., Inc., Chicago, Ill.
- Armstrong-Blum Mfg. Co., Chicago, Ill.
- Champion Blower & Forge Co., Lancaster, Pa.
- Heartley Machine & Tool Co., Toledo, O.
- Hendley & Whittemore Co., Beloit, Wis.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Perkins Machine Co., Warren, Mass.
- Rock River Machine Co., Inc., Janesville, Wis.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Whitney Mfg. Co., W. A., Rockford, Ill.
- Whitney Metal Tool Co., Rockford, Ill.

PUNCHES, HAND

- Allsteel Press Co., Inc., Chicago, Ill.
- Armstrong-Blum Mfg. Co., Chicago, Ill.
- Bertsch & Co., Cambridge City, Ind.
- Bollaert, M., Oakland, Cal.
- Buffalo Forge Co., Buffalo, N. Y.
- Champion Blower & Forge Co., Lancaster, Pa.
- Cleveland Punch & Shear Works Co., Cleveland, O.
- Clough, A. W., Meriden, Conn.
- Heartley Machine & Tool Co., Toledo, O.
- Hendley & Whittemore Co., Beloit, Wis.
- Johnson, Inc., William, Newark, N. J.
- Kidder Mfg. Co., Inc., J. F. Burlington, Vt.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Parker-Kalon Corp., New York City.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Pels & Co., Inc., Henry, New York City.
- Rock River Machine Co., Inc., Janesville, Wis.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Service Machine Co., Elizabeth, N. J.
- Whitney Mfg. Co., W. A., Rockford, Ill.
- Whitney Metal Tool Co., Rockford, Ill.

PUNCHES, POWER

- Allsteel Press Co., Inc., Chicago, Ill.
- Beatty Machine & Mfg. Co., Hammond, Ind.
- Bertsch & Co., Cambridge City, Ind.
- Bliss Co., E. W., Toledo, O.
- Buffalo Forge Co., Buffalo, N. Y.
- Callahan Can Machine Co., Inc., Brooklyn, N. Y.
- Cleveland Punch & Shear Works Co., Cleveland, O.
- Excelsior Tool and Machine Co., East St. Louis, Ill.
- Heartley Machine & Tool Co., Toledo, O.
- Hendley & Whittemore Co., Beloit, Wis.
- Henry & Wright Mfg. Co., Hartford, Conn.
- New Albany Machine Mfg. Co., New Albany, Ind.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Pels & Co., Inc., Henry, New York City.
- Perkins Machine Co., Warren, Mass.
- Rock River Machine Co., Inc., Janesville, Wis.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Service Machine Co., Elizabeth, N. J.
- Swaine Mfg. Co., Fred J., St. Louis, Mo.
- Whitney Metal Tool Co., Rockford, Ill.
- Zeh & Hahnemann Co., Newark, N. J.

QUADRANTS, DAMPER

- American Foundry & Furnace Co., Bloomington, Ill.
- California Cornice Works, Inc., Los Angeles, Cal.

- Hart & Cooley Mfg. Co., Chicago, Ill.
- Jamar Co., Walker, Duluth, Minn.
- Littleford Bros., Cincinnati, O.
- Northern Weatherstrip Co., Duluth, Minn.
- Ohio Products Co., Cleveland, O.
- Parker-Kalon Corp., New York City.
- Schoedinger Co., F. O., Columbus, O.
- Young Regulator Co., Cleveland, O.

REBUILT MACHINERY

See Machinery, Rebuilt and Used

RECORDERS, HUMIDITY

- Bristol Co., Waterbury, Conn.
- Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co., Philadelphia, Pa.
- Friez & Sons, Inc., Julien P., Baltimore, Md.
- H-B Instrument Co., Inc., Philadelphia, Pa.
- Leeds & Northrup Co., Philadelphia, Pa.
- Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.
- Taylor Instrument Companies, Rochester, N. Y.

RECORDERS, TEMPERATURE

- Bristol Co., Waterbury, Conn.
- Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co., Philadelphia, Pa.
- Friez & Sons, Inc., Julien P., Baltimore, Md.
- H-B Instrument Co., Inc., Philadelphia, Pa.
- Leeds & Northrup Co., Philadelphia, Pa.
- Practical Instrument Co., Chicago, Ill.
- Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.
- Taylor Instrument Companies, Rochester, N. Y.

REFRACTORIES

- Chapman Clay Co., Zanesville, O.
- Fireline Stove & Furnace Lining Co., Chicago, Ill. (Plastic firepot lining)
- Johns-Manville, New York City. (Cement and monolithic)
- Keasbey & Mattison Co., Ambler, Pa.
- Laclede-Christy Clay Products Co., St. Louis, Mo. (Fire brick and high temperature mortars)
- Nelson Co., Detroit, Mich.
- Pyrolite Products Co., Cleveland, O.
- Standard Fuel Engineering Co., Detroit, Mich.
- Walsh Refractories Corp., St. Louis, Mo.

REGISTER SHIELDS

See Shields, Warm Air Register

REFRIGERATING UNITS

See Compressors, Refrigerating

REGISTERS, DIRECTIONAL FLOW

- Auer Register Co., Cleveland, O.
- Barber-Colman Co., Rockford, Ill.
- Duckworth-Elsey Metal Products Co., Detroit, Mich.
- Eckenroth, Harry L., San Francisco, Cal.
- Gillian Mfg. Co., Detroit, Mich.
- Hart & Cooley Mfg. Co., Chicago, Ill.
- Independent Register Co., Cleveland, O.
- Hendrick Mfg. Co., Carbondale, Pa.
- National Fan & Blower Corp., Chicago, Ill.
- Tuttle & Bailey, Inc., New Britain, Conn.
- United States Register Co., Battle Creek, Mich.
- Waterloo Register Co., Waterloo, Ia.

REGISTERS, HEATING AND VENTILATING

- American Foundry & Furnace Co., Bloomington, Ill.
- Auer Register Co., Cleveland, O.
- Barber-Colman Co., Rockford, Ill.
- Bergstrom Mfg. Co., Neenah, Wis.
- Best Register Co., Milwaukee, Wis.
- Diamond Mfg. Co., Wyoming, Pa.
- Forest City Foundries Co., Cleveland, O.
- Gillian Mfg. Co., Detroit, Mich.
- Hart & Cooley Mfg. Co., Chicago, Ill.
- Hendrick Mfg. Co., Carbondale, Pa.
- Independent Register Co., Cleveland, O.
- Lamneck Products, Inc., Columbus, O.
- Liberty Foundry Co., St. Louis, Mo.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Newman Brothers, Inc., Cincinnati, O.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
- Roberts-Hamilton Co., Minneapolis, Minn.
- Rock Island Register Co., Rock Island, Ill.
- Springman Metal Specialty Co., Detroit, Mich.
- Standard Stamping & Perforating Co., Chicago, Ill.
- Tuttle & Bailey, Inc., New Britain, Conn.
- United States Register Co., Battle Creek, Mich.
- Waterloo Register Co., Waterloo, Ia.

REGULATORS, DRAFT, SMOKE PIPE

- Anderson Products, Inc., Cambridge, Mass.
- Bristol Co., Waterbury, Conn.
- Dutcher Heating Co., Canton, Mass.
- Field Mfg. Co., Chicago, Ill.
- Gold Seal Furnace Co., Minneapolis, Minn. (Automatic)
- Harvey-Whipple, Inc., Springfield, Mass.
- Hotentot Co., Inc., Omaha, Nebr.
- Hotstream Heater Co., Cleveland, O. (Automatic)
- Parker-Kalon Corp., New York City.
- Platt Products Corp., Lansing, Mich. (6 and 9-inch)
- Polk Mfg. Co., Madison, Wis.
- Walker Mfg. & Sales Corp., St. Joseph, Mo.

REGULATORS, FURNACE DRAFT, MECHANICAL

- Automatic Humidifier Co., Cedar Falls, Ia.
- Automatic Products Co., Milwaukee, Wis.
- Barber-Colman Co., Rockford, Ill.
- Dutcher Heating Co., Canton, Mass.
- Gleason-Avery, Inc., Auburn, N. Y.
- Gold Seal Furnace Co., Minneapolis, Minn.
- Hart & Cooley Mfg. Co., Chicago, Ill.
- Hays Corp., Michigan City, Ind.
- Mercoild Corp., Chicago, Ill.
- Minneapolis Automatic Draft Regulator Co., Minneapolis, Minn.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Russell Electric Co., Chicago, Ill.
- Safe Automatic Heat Control Co., Detroit, Mich.
- Tillery's Little Janitor Clock Co., Newark, N. J.
- Uni-Therm, Inc., Elyria, O.

RELAYS, ELECTRICAL

- Allen-Bradley Co., Milwaukee, Wis.
- Automatic Switch Co., New York City.
- Bender Warrick Corp., Birmingham, Mich.
- Clark Controller Co., Cleveland, O.
- Cook Electric Co., Chicago, Ill.
- Cutler-Hammer, Inc., Milwaukee, Wis.
- Detroit Lubricator Co., Detroit, Mich.
- Dunn, Inc., Struthers, Philadelphia, Pa.
- Electric Controller & Mfg. Co., Cleveland, O.
- Fries & Sons, Inc., Julien P., Baltimore, Md.
- General Controls Co., San Francisco, Cal., and Cleveland, O.
- General Electric Co., Schenectady, N. Y.
- Gleason-Avery, Inc., Auburn, N. Y.
- Guardian Electric Mfg. Co., Chicago, Ill.
- H-B Instrument Co., Inc., Philadelphia, Pa.
- Hart Mfg. Co., Hartford, Conn.
- McCorkle Co., D. H., Berkeley, Calif.
- Mercoild Corp., Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Penn Electric Switch Co., Des Moines, Ia.
- Perfex Controls Co., Milwaukee, Wis.
- Precision Thermometer & Instrument Co., Philadelphia, Pa.
- Russell Electric Co., Chicago, Ill.
- Sheer Co., H. M., Quincy, Ill.
- Ward Leonard Electric Co., Mt. Vernon, N. Y.
- Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

REPAIRS, STOVE AND FURNACE

- Adams Co., Dubuque, Ia.
- Bardes Range & Foundry Co., E. H., Cincinnati, O.
- Brauer Supply Co., A. G., St. Louis, Mo.
- Capitol Furnace & Stove Repair Co., Indianapolis, Ind.
- Central Furnace & Stove Repair Co., St. Louis, Mo.
- Cincinnati Stamping Co., Cincinnati, O.
- Detroit Michigan Stove Co., Detroit, Mich.
- Edwards Furnace Co., Wellsboro, Pa.
- Faultless Heater Corp., Cleveland, O.
- Forest City Foundries Co., Cleveland, O.
- Henry Furnace & Foundry Co., Cleveland, O.
- Keith Furnace Co., Des Moines, Ia.
- Marshall Furnace Co., Marshall, Mich.
- Metzner Stove Repair Co., Kansas City, Mo.
- Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
- National Foundry & Furnace Co., Dayton, O.
- Northwestern Stove Repair Co., Chicago, Ill.
- Peerless Foundry Co., Indianapolis, Ind.
- Peninsular Stove Co., Detroit, Mich.
- Round Oak Co., Dowagiac, Mich.
- Security Stove & Mfg. Co., Kansas City, Mo.
- Standard Foundry & Furnace Co., De Kalb, Ill.
- Stiglitz Furnace & Foundry Co., Louisville, Ky.
- Wayne Pattern & Foundry Co., Fort Wayne, Ind.
- Williamson Heater Co., Cincinnati, O.

RIDGE ROLLS AND RIDGING

- Ames Co., W. R., San Francisco, Cal.
- Barnes Metal Products Co., Chicago, Ill.
- Berger Bros. Co., Philadelphia, Pa.
- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.

- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Danzer Metal Works, Inc., Hagerstown, Md.
- Decatur Iron & Steel Co., Decatur, Ala.
- Downs-Smith Brass & Copper Co., Long Island City, N. Y.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Gulf States Steel Co., Birmingham, Ala.
- Hussey & Co., C. G., Pittsburgh, Pa. (Copper)
- Inland Steel Co., Chicago, Ill.
- Klauser Mfg. Co., Dubuque, Ia.
- La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- Lamb & Ritchie Co., Cambridge, Mass.
- Martin Metal Mfg. Co., Wichita, Kan.
- Meyer & Bro. Co., F., Peoria, Ill.
- Milcor Steel Co., Milwaukee, Wis.
- New Delphos Mfg. Co., Delphos, O.
- Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
- Osborn Co., J. M., & L. A., Cleveland, O.
- Providence Cornice Co., Providence, R. I.
- Reeves Mfg. Co., Dover, O.
- Republic Steel Corp., Cleveland, O.
- Ryniker Sheet Metal Works, Inc., Billings, Mont.
- Schoedinger Co., F. O., Columbus, O.
- Southbridge Roofing Co., Inc., Southbridge, Mass.
- Southern States Iron Roofing Co., Savannah, Ga.
- Tiffin Art Metal Co., Tiffin, O.
- Van Noorden Co., E., Boston, Mass.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Willis Mfg. Co., Galesburg, Ill.
- Woolwine Metal Products Co., Los Angeles, Cal.
- Youngstown Sheet & Tube Co., Youngstown, O.

RINGS, HANGER, BLOW PIPE*See Fittings, Blow Pipe***RIVETS, ALLOY**

- Allegheny Steel Co., Brackenridge, Pa. (Stainless)
- Bethlehem Steel Co., Bethlehem, Pa.
- Clark Bros. Bolt Co., Milldale, Conn.
- Duriron Co., Inc., Dayton, O. (Steel, chromium-nickel)
- Republic Steel Corp., Cleveland, O. (Stainless steel and steel)
- Townsend Co., New Brighton, Pa.

RIVETS, ALUMINUM

- Aluminum Company of America, Pittsburgh, Pa.
- Bridgeport Screw Co., Bridgeport, Conn.
- Continental Screw Co., New Bedford, Mass.
- Hassall, Inc., John, Brooklyn, N. Y.
- Townsend Co., New Brighton, Pa.

RIVETS, BRASS, COPPER AND IRON

- Abbott Mfg. Co., Painesville, O.
- Atlas Bolt & Screw Co., Cleveland, O.
- Bethlehem Steel Co., Bethlehem, Pa.
- Bridgeport Screw Co., Bridgeport, Conn.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Continental Screw Co., New Bedford, Mass.
- Hassall, Inc., John, Brooklyn, N. Y.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Inland Steel Co., Chicago, Ill.
- National Screw & Mfg. Co., Cleveland, O.
- Revere Copper & Brass, Inc., New York City.
- Townsend Co., New Brighton, Pa.

ROD, WELDING

- Air Reduction Sales Co., New York City.
- Aluminum Company of America, Pittsburgh, Pa. (Aluminum)
- American Brass Co., Waterbury, Conn.
- American Chain Co., Inc., Bridgeport, Conn.
- American Steel Co., Pittsburgh, Pa.
- American Steel & Wire Co., Chicago, Ill.
- Bridgeport Brass Co., Bridgeport, Conn.
- Central Steel & Wire Co., Chicago, Ill.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Chicago Steel & Wire Co., Chicago, Ill.
- Consolidated Screw Co., New Bedford, Mass.
- Crucible Steel Co. of America, New York City.
- Handy & Harmon, New York City.
- Imperial Brass Mfg. Co., Chicago, Ill.
- International Nickel Co., Inc., New York City (Monel Metal)
- Lee & Son Co., K. O., Aberdeen, S. D.
- Linde Air Products Co., New York City.
- Maurath, Inc., Cleveland, O.
- Milburn Co., Alexander, Baltimore, Md.
- Page Steel & Wire Co., Monessen, Pa. (Stainless Steel)
- Revere Copper & Brass, Inc., New York City.
- Sight Feed Generator Co., Richmond, Ind.
- Torchweld Equipment Co., Chicago, Ill.
- Una Welding, Inc., Cleveland, O.
- Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
- Wickwire Spencer Steel Co., New York City.
- Youngstown Sheet & Tube Co., Youngstown, O.

ROLLS (HAND AND POWER), FORMING, BENDING

- Bertsch & Co., Cambridge City, Ind.
- Hendley & Whittemore Co., Beloit, Wis.
- Maplewood Machinery Co., Inc., Chicago, Ill.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Schatz Mfg. Co., Poughkeepsie, N. Y.

ROOFING, ALUMINUM

- Biersach & Niedermeyer Co., Milwaukee, Wis.
- Fingles, Inc., W. A. Baltimore, Md.
- Southern States Iron Rfg. Co., Savannah, Ga.

ROOFING, BUILT-UP

- American Brass Co., Waterbury, Conn.
- Barber Co., Inc., Philadelphia, Pa.
- Barrett Co., New York City.
- Bird & Son, Inc., East Walpole, Mass.
- Cabot, Inc., Samuel, Boston, Mass.
- Carey Co., Philip, Lockland, Cincinnati, O.
- Certain-teed Products Corp., New York City.
- Flintkote Co., New York City.
- Johns-Manville, New York City.
- Koppers Products Co., Pittsburgh, Pa. (Pitch and Felt)
- Logan-Long Co., Chicago, Ill.
- National Mfg. Corp., Tonawanda, N. Y.
- Reilly Tar & Chemical Co., Indianapolis, Ind.
- Ruberoid Co., New York City.
- United States Gypsum Co., Chicago, Ill.

ROOFING, COPPER

- American Brass Co., Waterbury, Conn.
- Braden Mfg. Co., Terre Haute, Ind.
- Bridgeport Brass Co., Bridgeport, Conn.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Danzer Metal Works, Inc., Hagerstown, Md.
- Downs-Smith Brass & Copper Co., Long Island City, N. Y.
- Edwards Mfg. Co., Inc., Cincinnati, O. (Metal Shingles, Spanish Tile)
- Fingles, Inc., W. A., Baltimore, Md.
- Hermann & Grace Co., Brooklyn, N. Y.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Meyer & Bro. Co., F., Peoria, Ill.
- Milcor Steel Co., Milwaukee, Wis.
- National Brass & Copper Co., Inc., Pittsburgh, Pa.
- New Haven Copper Co., Seymour, Conn.
- Revere Copper & Brass, Inc., New York City.
- Southern States Iron Roofing Co., Savannah, Ga.
- Tiffin Art Metal Co., Tiffin, O.
- Wheeling Metal & Mfg. Co., Wheeling, W. Va.

ROOFING, IRON AND STEEL

- Allegheny Steel Co., Brackenridge, Pa. (Stainless)
- American Rolling Mill Co., Middletown, O.
- Ames Co., W. R., San Francisco, Cal.
- Apollo Steel Co., Apollo, Pa.
- Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.
- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Bethlehem Steel Co., Bethlehem, Pa.
- Biersach & Niedermeyer Co., Milwaukee, Wis.
- Braden Mfg. Co., Terre Haute, Ind.
- Budke Stamping Co., Canonsburg, Pa.
- Byers Co., A. M., Pittsburgh, Pa. (Wrought Iron)
- Carnegie-Illinois Steel Co., Pittsburgh, Pa.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Columbia Steel Co., San Francisco, Cal. (Steel)
- Danzer Metal Works, Inc., Hagerstown, Md.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Fingles, Inc., W. A., Baltimore, Md.
- Globe Iron Roofing & Corrugating Co., Cincinnati, O.
- Gulf States Steel Co., Birmingham, Ala.
- Inland Steel Co., Chicago, Ill. (Steel)
- Klauer Mfg. Co., Dubuque, Ia.
- La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
- Martin Metal Mfg. Co., Wichita, Kan.
- Meyer & Bro. Co., F., Peoria, Ill.
- Milcor Steel Co., Milwaukee, Wis.
- New Delphos Mfg. Co., Delphos, O.
- Newport Rolling Mill Co., Newport, Ky.
- Niles Rolling Mill Co., Niles, O.
- Parkersburg Iron & Steel Co., Parkersburg, W. Va.
- Reeves Mfg. Co., Dover, O.
- Republic Steel Corp., Cleveland, O.
- Robertson Co., H. H., Pittsburgh, Pa.
- St. Paul Corrugating Co., St. Paul, Minn.
- Southbridge Roofing Co., Inc., Southbridge, Mass.
- Southern States Iron Rfg. Co., Savannah, Ga.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. (Steel)
- Tiffin Art Metal Co., Tiffin, O.
- Truscon Steel Co., Youngstown, O.
- Van Noorden Co., E., Boston, Mass.

- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Metal & Mfg. Co., Wheeling, W. Va.
- Wheeling Steel Corp., Wheeling, W. Va.
- York Corrugating Co., York, Pa.
- Youngstown Sheet & Tube Co., Youngstown, O.

ROOFING, LEAD

- Biersach & Niedermeyer Co., Milwaukee, Wis.
- Downs-Smith Brass & Copper Co., Long Island City, N. Y.
- Fingles, Inc., W. A., Baltimore, Md.
- National Lead Co., New York City.
- Rochester Lead Works, Rochester, N. Y.
- Southbridge Roofing Co., Inc., Southbridge, Mass.

ROOFING PAINT

See Paint, Roofing

ROOFING, SLATE

- Bangor-Washington Slate Co., Bangor, Pa.
- Chapman Slate Co., Bethlehem, Pa.
- Jackson-Bangor Slate Co., Pen Argyl, Pa.
- North Bangor Slate Co., Bangor, Pa.
- Rising & Nelson Slate Co., West Pawlet, Vt.
- Sheldon Slate Co., F. C., Granville, N. Y.
- Structural Slate Co., Pen Argyl, Pa.
- Vendor Slate Co., Inc., Nazareth, Pa.
- Vermont Structural Slate Co., Fair Haven, Vt.

ROOFING, TILE (CLAY & CONCRETE)

- Hood Co., B. Mifflin, Daisy, Tenn. (Clay).
- Ludowici-Celadon Co., Chicago, Ill.
- Murray Tile Co., Cloverport, Ky.

ROOFING, TIN

- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Biersach & Niedermeyer Co., Milwaukee, Wis.
- Carnegie-Illinois Steel Co., Pittsburgh, Pa.
- Follansbee Bros. Co., Pittsburgh, Pa.
- Milcor Steel Co., Milwaukee, Wis.
- Southbridge Roofing Co., Inc., Southbridge, Mass.
- Southern States Iron Rfg. Co., Savannah, Ga.
- Taylor Co., N. & G., Div. Republic Steel Co., Cumberland Md.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Steel Corp., Wheeling, W. Va.

ROOFING, ZINC

- American Zinc Products Co., Greencastle, Ind.
- Barnes Metal Products Co., Chicago, Ill.
- Illinois Zinc Co., Peru, Ill.
- Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Southern States Iron Rfg. Co., Savannah, Ga.
- Van Noorden Co., E., Boston, Mass.
- Wheeling Corrugating Co., Wheeling, W. Va. (Coated)
- Wheeling Steel Corp., Wheeling, W. Va. (Coated)

SAVERS, HEAT

- Bedard Mfg. Co., Minneapolis, Minn. (Smoke Pipe)
- Brown Sheet Iron & Steel Co., St. Paul, Minn.
- Cary Mfg. Co., Waupaca, Wis.
- Chinook, Inc., St. Paul, Minn.
- Crown Fuel Saver Co., Richmond, Ind.
- Gerhardt, W. F., Richmond, Va.
- Harvey-Whipple, Inc., Springfield, Mass.
- Heat Control Corp., Milwaukee, Wis.
- Meyers Fuel Saver Co., Inc., Janesville, Wis.
- Roberts-Hamilton Co., Minneapolis, Minn.
- Wolff Coal Saver Co., Chicago, Ill.
- Woolery Machine Co., Minneapolis, Minn.

SAWS, BAND, SHEET METAL CUTTING

- Tannewitz Works, Grand Rapids, Mich.
- Wells Mfg. Corp., Three Rivers, Mich.

SCREWS, DRIVE

- American Screw Co., Providence, R. I.
- Anti-Corrosive Metal Products Co., Inc., Castleton-on-Hudson, N. Y. (Stainless Steel)
- Continental Screw Co., New Bedford, Mass.
- Corbin Screw Corp., New Britain, Conn.
- Deniston Co., Chicago, Ill.
- Hassall, Inc., John, Brooklyn, N. Y.
- National Screw & Mfg. Co., Cleveland, O.
- Parker-Kalon Corp., New York City (Hardened Metallic)
- Turner & Seymour Mfg. Co., Torrington, Conn.

SCREWS, SELF-TAPPING

- Continental Screw Co., New Bedford, Mass.
- National Screw & Mfg. Co., Cleveland, O.
- Parker-Kalon Corp., New York City.

SCREWS, SHEET METAL

- Allegheny Steel Co., Brackenridge Pa. (Stainless)
- Aluminum Co. of America, Pittsburgh, Pa. (Aluminum)
- American Screw Co., Providence, R. I.
- Anti-Corrosive Metal Products Co., Inc., Castleton-on-Hudson, N. Y. (Stainless Steel)
- Continental Screw Co., New Bedford, Mass.
- Hassall, Inc., John, Brooklyn, N. Y.
- National Screw & Mfg. Co., Cleveland, O.
- Parker-Kalon Corp., New York City.

SHALLOW WELL PUMPS

See Pumps, Shallow Well

SHAPES, STRUCTURAL

See Angles, Bars, Beams, Channels and Tees (Structural Shapes)

SHEARS, HAND AND BENCH

See Snips and Shears, Bench and Hand

SHEARS AND PUNCHES COMBINED

See Punches and Shears Combined

SHEARS, PORTABLE, ELECTRIC

- G. D. S. Shearing & Punching Machine Co., New York City
- Glascok Bros. Mfg. Co., Muncie, Ind.
- Skilsaw, Inc., Chicago, Ill.
- Stanley Electric Tool Div., Stanley Works, New Britain, Conn.

SHEARS, POWER

- Allsteel Press Co., Inc., Chicago, Ill.
- Beatty Machine & Mfg. Co., Hammond, Ind.
- Bertsch & Co., Cambridge City, Ind.
- Bliss Co., E. W., Toledo, O.
- Buffalo Forge Co., Buffalo, N. Y.
- Cincinnati Shaper Co., Cincinnati, O.
- Cleveland Punch & Shear Works Co., Cleveland, O.
- Dreis & Krump Mfg. Co., Chicago, Ill.
- Excelsior Tool and Machine Co., East St. Louis, Ill.
- Heartley Machine & Tool Co., Toledo, O.
- Hendley & Whittemore Co., Beloit, Wis.
- Libert Machine Co., Green Bay, Wis.
- Marshalltown Mfg. Co., Marshalltown, Ia.
- New Albany Machine Mfg. Co., New Albany, Ind.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Pels & Co., Inc., Henry, New York City
- Quickwork Co., St. Marys, O.
- Rock River Machine Co., Inc., Janesville, Wis.
- Schatz Mfg. Co., Poughkeepsie, N. Y.
- Wiedemann Machine Co., Philadelphia, Pa.
- Yoder Co., Cleveland, O.

SHEET METAL PARTS

See Mouldings and Trim; also Stampings, Metal

SHEETS, ALLOY

- Allegheny Steel Co., Brackenridge, Pa.
- American Brass Co., Waterbury, Conn. (Copper Alloys)
- American Rolling Mill Co., Middletown, O. (Stainless Steel)
- Carnegie-Illinois Steel Co., Pittsburgh, Pa. (Copper, High Finish and Stainless Steel)
- Crucible Steel Co. of America, New York City
- Duriron Co., Inc., Dayton, O. (Chromium-Nickel)
- Inland Steel Co., Chicago, Ill.
- International Nickel Co., Inc., New York City (Monel Metal)
- Lukens Steel Co., Coatesville, Pa.
- Newport Rolling Mill Co., Newport, Ky. (Pure Iron-Copper Alloy)
- Republic Steel Corp., Cleveland, O. (Steel)
- Sharon Steel Corp., Sharon, Pa.
- Wheeling Steel Corp., Wheeling, W. Va. (Cop-R-Loy)
- Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, ALUMINUM

- Aluminum Company of America, Pittsburgh, Pa.
- Fairmont Aluminum Co., Fairmont, W. Va.

SHEETS, CLAD

- Allegheny Steel Co., Brackenridge, Pa.
- Crucible Steel Co. of America, New York City
- International Nickel Co., Inc., New York City (Nickel Clad)
- Lukens Steel Co., Coatesville, Pa.

SHEETS, COPPER

- American Brass Co., Waterbury, Conn.
- Bridgeport Brass Co., Bridgeport, Conn.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Hussey & Co., C. G., Pittsburgh, Pa.
- National Brass & Copper Co., Inc., Pittsburgh, Pa.
- New Haven Copper Co., Seymour, Conn.
- Revere Copper & Brass, Inc., New York City
- U. S. Brass & Copper Co., Hyde Park, Mass.

SHEETS, COPPER BEARING STEEL

- American Rolling Mill Co., Middletown, O.
- Apollo Steel Co., Apollo, Pa.
- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie-Illinois Steel Co., Pittsburgh, Pa.
- Columbia Steel Co., San Francisco, Cal.
- Granite City Steel Co., Granite City, Ill.
- Gulf States Steel Co., Birmingham, Ala.
- Inland Steel Co., Chicago, Ill.
- Lukens Steel Co., Coatesville, Pa.
- Mahoning Valley Steel Co., Niles, O.
- New Delphos Mfg. Co., Delphos, O. (Galvanized Steel)
- Newport Rolling Mill Co., Newport, Ky.
- Niles Rolling Mill Co., Niles, O.
- Otis Steel Co., Cleveland, O.
- Republic Steel Corp., Cleveland, O.
- Superior Sheet Steel Co., Canton, O.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Weirton Steel Co., Weirton, W. Va.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Metal & Mfg. Co., Wheeling, W. Va.
- Wheeling Steel Corp., Wheeling, W. Va.
- Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, COPPER, LEAD COATED

- American Brass Co., Waterbury, Conn.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Ledkote Products Co., Long Island City, N. Y.
- National Brass & Copper Co., Inc., Pittsburgh, Pa.
- New Haven Copper Co., Seymour, Conn.
- Revere Copper & Brass, Inc., New York City
- U. S. Brass & Copper Co., Hyde Park, Mass.
- Wheeling Metal & Mfg. Co., Wheeling, W. Va.

SHEETS, GALVANNEALED

- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie-Illinois Steel Co., Pittsburgh, Pa.
- Continental Steel Corp., Kokomo, Ind.
- Granite City Steel Co., Granite City, Ill.
- Inland Steel Co., Chicago, Ill.
- Newport Rolling Mill Co., Newport, Ky.
- Republic Steel Corp., Cleveland, O.
- Sharon Steel Corp., Sharon, Pa.
- Superior Sheet Steel Co., Canton, O.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, LEAD

- Andrews Lead Co., Inc., Long Island City, N. Y.
- Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
- Eagle Picher Lead Co., Cincinnati, O.
- Flemm Lead Co., Inc., Long Island City, N. Y.
- Lissberger & Son, Inc., Marks, Long Island City, N. Y.
- National Lead Co., New York City.
- Rochester Lead Works, Rochester, N. Y.
- Standard Rolling Mills, Inc., Brooklyn, N. Y.

SHEETS, SPECIAL METAL

- (Nickel Zinc, Chrome Zinc, Nickel Coated Copper, Chromium Coated Copper, Nickel Coated Steel, Chromium Coated Steel, Chromium Coated Nickel Silver, Zinc Brass, Zinc Copper, etc.)
- American Nickeloid Co., Peru, Ill.
- Bridgeport Brass Co., Bridgeport, Conn.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Ingersoll Steel & Disc Co., Chicago, Ill.
- Lukens Steel Co., Coatesville, Pa.
- National Sheet Metal Co., Peru, Ill.
- Revere Copper & Brass, Inc., New York City.
- Wilder Metal Co., Niles, O.

SHEETS, STAINLESS

- Allegheny Steel Co., Brackenridge, Pa.
- American Rolling Mill Co., Middletown, O.
- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie-Illinois Steel Co., Pittsburgh, Pa.
- Crucible Steel Co. of America, New York City (Two-Ply)
- Ingersoll Steel & Disc Co., Chicago, Ill. (Two-Ply)
- International Nickel Co., New York City (Monel Metal)
- Jessop Steel Co., Washington, Pa.
- Ludlum Steel Co., Watervliet, N. Y.
- Republic Steel Corp., Youngstown, O.
- Ryerson & Son, Inc., Jos. T., Chicago, Ill.
- Sharon Steel Corp., Sharon, Pa.
- Superior Steel Corp., Pittsburgh, Pa.
- Universal Steel Co., Bridgeville, Pa.

SHEETS, STEEL

(Polished and Blue, Corrugated and Plain, Black, Terne and Galvanized)

- Allegheny Steel Co., Brackenridge, Pa.
- American Rolling Mill Co., Middletown, O.
- Apollo Steel Co., Apollo, Pa.
- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie-Illinois Steel Co., Pittsburgh, Pa.
- Columbia Steel Co., San Francisco, Cal.
- Continental Steel Corp., Kokomo, Ind.
- Crucible Steel Company of America, New York City.
- Empire Sheet & Tin Plate Co., Mansfield, O.
- Follansbee Brothers Co., Pittsburgh, Pa.
- Granite City Steel Co., Granite City, Ill.
- Gulf States Steel Co., Birmingham, Ala.
- Inland Steel Co., Chicago, Ill.
- Jones & Laughlin Steel Corp., Pittsburgh, Pa.
- Lukens Steel Co., Coatesville, Pa.
- Mahoning Valley Steel Co., Niles, O.
- Newport Rolling Mill Co., Newport, Ky.
- Niles Rolling Mill Co., Niles, O.
- Otis Steel Co., Cleveland, O.
- Parkersburg Iron & Steel Co., Parkersburg, W. Va.
- Reading Iron Co., Philadelphia, Pa. (Genuine Wrought Iron)
- Republic Steel Corp., Cleveland, O.
- Ryerson & Son, Inc., Jos. T., Chicago, Ill.
- Superior Sheet Steel Co., Canton, O.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Weirton Steel Co., Weirton, W. Va.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Metal & Mfg. Co., Wheeling, W. Va.
- Wheeling Steel Corp., Wheeling, W. Va.
- Wood Steel Co., Alan, Conshohocken, Pa.
- Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, TIN

- Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
- Bethlehem Steel Co., Bethlehem, Pa.
- Carnegie-Illinois Steel Co., Pittsburgh, Pa.
- Eagle Pitcher Lead Co., Cincinnati, O.
- Empire Sheet & Tin Plate Co., Mansfield, O.
- Follansbee Brothers Co., Pittsburgh, Pa.
- Granite City Steel Co., Granite City, Ill.
- Inland Steel Co., Chicago, Ill.
- Jones & Laughlin Steel Corp., Pittsburgh, Pa. (Tinned)
- National Lead Co., New York City.
- Rochester Lead Works, Inc., Rochester, N. Y.
- Ryerson & Son, Inc., Jos. T., Chicago, Ill.
- Standard Rolling Mills, Inc., Brooklyn, N. Y.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Weirton Steel Co., Weirton, W. Va.
- Wheeling Steel Corp., Wheeling, W. Va.
- Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, ZINC

- American Nickeloid Co., Peru, Ill.
- American Zinc Products Co., Greencastle, Ind.
- Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
- Illinois Zinc Co., Peru, Ill.
- Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- New Jersey Zinc Sales Co., New York City.
- Wheeling Corrugating Co., Wheeling, W. Va. (Coated)
- Wheeling Steel Corp., Wheeling, W. Va. (Coated)

SHIELDS, WARM AIR REGISTER

- Gammeter Co., W. F., Cadiz, O. (with Humidifier)
- Gillian Mfg. Co., Detroit, Mich.
- Hum-O-Zone Co., Horicon, Wis.
- Kauffman Air Conditioning Corp., St. Louis, Mo.
- Pentecost & Craft Co., Terre Haute, Ind.
- Schoedinger, F. O., Co., Columbus, O.
- Somers, Inc., H. J., Detroit, Mich.

SHINGLES AND TILE, METAL

- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Columbian Enameling & Stamping Co., Terre Haute, Ind.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Fingles, Inc., W. A., Baltimore, Md.
- Globe Iron Roofing & Corrugating Co., Cincinnati, O.
- Gulf States Steel Co., Birmingham, Ala.
- International Steel Co., Evansville, Ind.
- Milcor Steel Co., Milwaukee, Wis.
- Miller & Doing, Inc., Brooklyn, N. Y.
- New Haven Copper Co., Seymour, Conn. (Copper)
- Newport Rolling Mill Co., Newport, Ky.
- Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
- Reeves Mfg. Co., Dover, O.
- St. Paul Corrugating Co., St. Paul, Minn.
- Southern States Iron Roofing Co., Savannah, Ga.
- Tiffin Art Metal Co., Tiffin, O.
- Wheeling Corrugating Co., Wheeling, W. Va.
- Wheeling Metal & Mfg. Co., Wheeling, W. Va.

SHUTTERS

See Louvres and Shutters

SKYLIGHTS

- American Sheet Metal Works, New Orleans, La.
- Anderson Mfg. Co., Des Moines, Ia.
- Beatrice Steel Tank Mfg. Co., Beatrice, Nebr.
- Berger Co., L. D., Philadelphia, Pa.
- Biersach & Niedermeyer Co., Milwaukee, Wis.
- California Cornice Works, Inc., Los Angeles, Cal.
- Chicago Metal Mfg. Co., Chicago, Ill.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Danzer Metal Works, Inc., Hagerstown, Md.
- Decatur Iron & Steel Co., Decatur, Ala.
- Drouve Co., G., Fairfield, Conn.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Falstrom Co., Passaic, N. J.
- Fingles, Inc., W. A., Baltimore, Md.
- General Sheet Metal Works, Inc., Bridgeport, Conn.
- Goethel Co., Alfred C., Milwaukee, Wis.
- Herrmann & Grace Co., Brooklyn, N. Y.
- Hirschman Co., Inc., W. F., Buffalo, N. Y.
- Hudson Equipment Corp., Minneapolis, Minn.
- International Steel Co., Evansville, Ind.
- Klauer Mfg. Co., Dubuque, Ia.
- Lee & Son Co., Thomas, Cincinnati, O.
- Martin Metal Mfg. Co., Wichita, Kan.
- Meyer & Bro. Co., F., Peoria, Ill.
- Midwest Aluminum Products, Inc., Milwaukee, Wis.
- Midwest Ventilating Works, Milwaukee, Wis.
- Milcor Steel Co., Milwaukee, Wis.
- Norman Sheet Metal Mfg. Co., W. F., Nevada, Mo.
- Park City Cornice Works, Inc., Bridgeport, Conn.
- Perkinson & Brown, Chicago, Ill.
- Providence Cornice Co., Providence, R. I.
- Robertson Co., H. H., Pittsburgh, Pa.
- Ryniker Sheet Metal Works, Inc., Billings, Mont.
- St. Paul Corrugating Co., St. Paul, Minn.
- Schoedinger, F. O., Co., Columbus, O.
- Southbridge Roofing Co., Inc., Southbridge, Mass.
- Southern States Iron Roofing Co., Savannah, Ga.
- Van Noorden Co., E., Boston, Mass.
- Vent-O-Lite Co., Chicago, Ill. (Ventilating)
- Ward Co., H. H., Chester, Pa.
- Watson Co., Inc., Jas. H., Bradley, Ill.
- Wheeling Metal & Mfg. Co., Wheeling, W. Va.
- Willis Mfg. Co., Galesburg, Ill.
- Windshield Scupper Co., New York City (Scuppers)
- York Corrugating Co., York, Pa.

SKYLIGHT LIFTS

See Lifts, Skylight

SMOKE PIPE

See Pipe, Smoke

SMOKE PIPE DAMPERS

See Dampers, Smoke Pipe

SMOKE PIPE FITTINGS

See Fittings and Accessories, Smoke Pipe

SNIPS AND SHEARS, BENCH AND HAND

- Armstrong-Blum Mfg. Co., Chicago, Ill.
- Bartlett Mfg. Co., Detroit, Mich.
- Beverly Throatless Shear Co., Chicago, Ill.
- Bremil Mfg. Co., Erie, Pa. (Shears)

- Clauss Shear Co., Fremont, O.
- Grobet File Corp. of America, New York City.
- Marshalltown Mfg. Co., Marshalltown, Ia.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Rupp Forge & Shear Co., Cleveland, O.
- Viking Shear Co., Erie, Pa.
- Wiss & Sons Co., J., Newark, N. J.

SOLDER

- Alumaweld Co. of America, Chicago, Ill.
- American Brass Co., Waterbury, Conn.
- Andrews Lead Co., Inc., Long Island City, N. Y.
- Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Downs-Smith Brass & Copper Co., Long Island City, N. Y.
- Eagle-Picher Co., Cincinnati, O. (Bar and Wire)
- Empire Metal Co., Syracuse, N. Y.
- Gardiner Metal Co., Chicago, Ill.
- Handy & Harmon, New York City.
- Johnston Tin Foil & Metal Co., St. Louis, Mo.
- Kester Solder Co., Chicago, Ill.
- Lissberger & Son, Inc., Marks, Long Island City, N. Y.
- Lukens Metal Co., Thos. F., Philadelphia, Pa.
- Merchant & Evans Co., Philadelphia, Pa.
- National Lead Co., New York City.
- New Delphos Mfg. Co., Delphos, O.
- Ruby Chemical Co., Columbus, O. (Acid and Rosin Core)
- Ryerson & Son, Inc., Joseph T., Chicago, Ill.
- Standard Rolling Mills, Inc., Brooklyn, N. Y.
- Wagner, C. DeWitt, Cedar Rapids, Ia. (Aluminum)

SOLDERING COPPERS*See Coppers, Soldering***SOLDERING FLUX***See Flux, Soldering***SOLDERING FURNACES***See Furnaces, Soldering***SOLDERING IRONS***See Coppers, Soldering***SOLDERING TORCHES***See Torches, Soldering***SOLENOID VALVES***See Valves, Solenoid***SOUND DEADENERS***See Insulation, Sound Deadening, Ducts***SOUND LEVEL INDICATORS***See Indicators, Sound Level***SPRAY GUNS***See Guns, Spray***SPOT WELDERS***See Welders, Spot***SPRAY NOZZLES***See Nozzles, Spray***STEEL CEILINGS***See Ceilings, Metal***STAMPINGS, METAL**

- Berger Mfg. Co., Div. of Republic Steel Corp., Canton, O.
- Bossert Corp., Utica, N. Y.
- Budke Stamping Co., Cannonsburg, Pa.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Dall Steel Products Co., Lansing, Mich.
- Friedley-Voshardt Co., Chicago, Ill.
- Geuder, Paeschke & Frey Co., Milwaukee, Wis.
- Gillian Mfg. Co., Detroit, Mich.
- Globe Machine & Stamping Co., Cleveland, O.
- Lukens Steel Co., Coatesville, Pa.
- Martin-Parry Corp., York, Pa.
- Meyer & Bro. Co., F., Peoria, Ill.
- Osborn Co., J. M. & L. A., Cleveland, O.
- Perrin Company, Edward C., Camden, N. J.
- Standard Stamping & Perforating Co., Chicago, Ill.
- Wrought Washer Mfg. Co., Milwaukee, Wis.
- Youngstown Pressed Steel Co., Warren, O.

STOKER CONTROLS*See Controls, Stoker***STOKERS, DOMESTIC**

- Advance Appliance Co., Peoria, Ill.
- Airtemp, Inc., Dayton, O.
- Anchor Stove & Range Co., New Albany, Ind.
- Apex Tool Co., Inc., Bridgeport, Conn.
- Athens Plow Co., Athens, Tenn.
- Auburn Stoker Co., Auburn, Ind.
- Automatic Stoker Corp., Indianapolis, Ind.
- Bardes Range & Foundry Co., E. H., Cincinnati, O.
- Beckley Perforating Co., Garwood, N. J.
- Bluffton Mfg. Co., Findlay, O.
- Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
- Brownell Co., Dayton, O.
- Burnham Stoker Co., Vancouver, Wash.
- Burnwell Corp., Allentown, Pa.
- Butler Mfg. Co., Kansas City, Mo.
- Chicago Automatic Stoker Co., Not Inc., Chicago, Ill.
- Christensen Machine Co., Salt Lake City, Utah.
- Columbus Metal Products, Inc., Columbus, O.
- Econocol Stoker Div. of Cotta Transmission Corp., Rockford, Ill.
- Eddy Stoker Corp., Chicago, Ill.
- Electric Furnace-Man, Inc., New York City.
- Fairbanks, Morse & Co., Chicago, Ill.
- Finnell Rotary Stokers, Inc., Elkhart, Ind.
- Free-Man Stoker & Eng. Co., Chicago, Ill.
- Fuel Savers, Inc., Harrisburg, Pa.
- Furnaceslave, Inc., Indianapolis, Ind.
- Gehl Bros. Mfg. Co., West Bend, Wis.
- Germer Stove Co., Erie, Pa.
- Hall-Neal Furnace Co., Indianapolis, Ind.
- Hamilton Automatic Stoker Corp., Hamilton, O.
- Heating Assurance, Inc., Spokane, Wash.
- Holcomb & Hoke Mfg. Co., Indianapolis, Ind.
- Illinois Iron & Bolt Co., Chicago, Ill.
- Iron Fireman Mfg. Co., Cleveland, O.
- Jacobson Machine Works, Inc., A. E., Minneapolis, Minn.
- Kelvinator Corp., Detroit, Mich.
- Leach Co., Oshkosh, Wis.
- Liberty Coal Burner Co., St. Louis, Mo.
- Link Belt Co., Chicago, Ill.
- Model Mfg. Co., Richmond, Va.
- Moloch Foundry & Machine Co., Kaukauna, Wis.
- Morrissey & Co., Chicago, Ill.
- Morse Chain Co., Ithaca, N. Y.
- Muncie Gear Works, Inc., Muncie, Ind.
- National Steam Pump Co., Upper Sandusky, O.
- Nelson Corp., Herman, Moline, Ill.
- Nomis Corp., Lafayette, Ind.
- Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.
- Ormsby-Gray Combustion Service, Inc., St. Louis, Mo.
- Paragon Kol-Master Corp., Oregon, Ill.
- Perfectaire Corp., Baltimore, Md.
- Plymouth Industries, Inc., Plymouth, Ind.
- Racine Stoker Mfg. Co., Racine, Wis.
- Redi-Automatic Coal Burners, Inc., Spokane, Wash.
- Risdon Stoker Corp., Seattle, Wash.
- Sampson Stoker Corp., Mendota, Ill.
- Schwitzer-Cummins Co., Indianapolis, Ind.
- Scott-Newcomb, Inc., St. Louis, Mo.
- Sinker-Davis Co., Indianapolis, Ind.
- Steel Products Engineering Co., Springfield, O.
- Sto-Coke, Inc., Indianapolis, Ind.
- Stok-A-Fire Co., St. Louis, Mo.
- Stokermatic Co., Salt Lake City, Utah.
- Stoker Products, Inc., Decatur, Ill.
- Stokers, Inc., Detroit, Mich.
- Union Metal Mfg. Co., Canton, O.
- Whiting Corp., Harvey, Ill.
- Will-Burt Co., Orrville, O.

STOKERS, INDUSTRIAL AND COMMERCIAL

- Advanced Engineering Co., Philadelphia, Pa.
- American Coal Burner Co., Chicago, Ill.
- Anchor Stove & Range Co., New Albany, Ind.
- Auburn Stoker Co., Auburn, Ind.
- Bluffton Mfg. Co., Findlay, O.
- Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
- Brownell Co., Dayton, O.
- Butler Mfg. Co., Kansas City, Mo.
- Canton Stoker Corp., Canton, O.
- Carnes, Inc., John R., Lima, O.
- Chicago Automatic Stoker Co., Not Inc., Chicago, Ill.
- Christensen Machine Co., Salt Lake City, Utah.
- Columbus Metal Products, Inc., Columbus, O.
- Combustion Engineering Co., Inc., New York City.
- Delta Stoker Co., North Chicago, Ill.
- Detroit Stoker Co., Detroit, Mich.
- Diamond Castings Co., DuBois, Pa.

● Econocol Stoker Div. of Cotta Transmission Corp., Rockford, Ill.

Eddy Stoker Corp., Chicago, Ill.
Electric Furnace-Man, Inc., New York City (Small)
Fairbanks, Morse & Co., Chicago, Ill.
Flynn & Emrich Co., Baltimore, Md.
Frederick Iron & Steel Co., Frederick, Md.
Free-Man Stoker & Eng. Co., Chicago, Ill.
Fuel Savers, Inc., Harrisburg, Pa.
Gehl Bros. Mfg. Co., West Bend, Wis.
Hamilton Automatic Stoker Corp., Hamilton, O.
Hare Stoker Corp., Detroit, Mich.
Heating Assurance, Inc., Spokane, Wash.
Her-Born Eng. & Mfg. Co., Sandusky, O.
Holcomb & Hoke Mfg. Co., Indianapolis, Ind.
Illinois Iron & Bolt Co., Chicago, Ill.
Iron Fireman Mfg. Co., Cleveland, O.
Jacobson Machine Works, Inc., A. E., Minneapolis, Minn.
Johnston & Jennings Co., Cleveland, O.
Jordan & Co., Paul R., Indianapolis, Ind.
Leach Co., Oshkosh, Wis.
Link Belt Co., Chicago, Ill.
McClave-Brooks Co., Scranton, Pa.
Marion Machine Foundry & Supply Co., Marion, Ind.
Model Mfg. Co., Richmond, Va.
Moloch Foundry & Machine Co., Kaukauna, Wis.
Morrissey & Co., Chicago, Ill.
Motorstoker Div. of Hershey Machine & Foundry Co., Manheim, Pa.
National Steam Pump Co., Upper Sandusky, O.
Neemes Foundry, Inc., Troy, N. Y.
Nomis Corp., Lafayette, Ind.
Ormsby-Gray Combustion Service, Inc., St. Louis, Mo.
Over-Spred Stoker Co., Ottawa, Ill.
Patterson Foundry & Machine Co., East Liverpool, O.
Perfectaire Corp., Baltimore, Md.
Perfection Grate & Stoker Co., Springfield, Mass.
Plymouth Industries, Inc., Plymouth, Ind.
Redi-Automatic Coal Burners, Inc., Spokane, Wash.
Rosedale Fdry. & Mach. Co., N. S., Pittsburgh, Pa.
Sampson Stoker Corp., Mendota, Ill.
● Schwitzer-Cummins Co., Indianapolis, Ind.
Steel Products Engineering Co., Springfield, O.
Stok-a-Fire Co., St. Louis, Mo.
Stokermatic Co., Salt Lake City, Utah.
Stoker Products, Inc., Decatur, Ill.
Stokers, Inc., Detroit, Mich.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Whiting Corp., Harvey, Ill.
Will-Burt Co., Orrville, O.

STOVE PIPE

See Pipe, Stove

STRAINERS, CONDUCTOR

See Fittings and Accessories, Conductor

STRAPS, LEADER

See Fittings and Accessories, Conductor

STRUCTURAL SHAPES

See Angles, Bars, Beams, Channels and Tees (Structural Shapes)

SWITCHES, MAGNETIC

Allen-Bradley Co., Milwaukee, Wis.
Automatic Reclosing Circuit Breaker Co., Columbus, O.
Automatic Switch Co., New York City.
Bender Warrick Corp., Birmingham, Mich.
Clark Controller Co., Cleveland, O.
● Cook Electric Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
● Detroit Lubricator Co., Detroit, Mich.
Dunn, Inc., Struthers, Philadelphia, Pa.
Electric Controller & Mfg. Co., Cleveland, O.
Guardian Electric Mfg. Co., Chicago, Ill.
H-B Instrument Co., Inc., Philadelphia, Pa.
Hart Mfg. Co., Hartford, Conn. (Mercury Tube).
● Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
● Penn Electric Switch Co., Des Moines, Ia.
● Perfex Controls Co., Milwaukee, Wis.
● Russell Electric Co., Chicago, Ill.
Square D Co., Detroit, Mich.
Trumbull Electric Mfg. Co., Plainville, Conn.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric & Mfg. Co., Mansfield, O.

SWITCHES, MANUAL

Allen-Bradley Co., Milwaukee, Wis.
Bender Warrick Corp., Birmingham, Mich.

Cutler-Hammer, Inc., Milwaukee, Wis.
Electric Controller & Mfg. Co., Cleveland, O.
Square D Co., Detroit, Mich.
Trumbull Electric Mfg. Co., Plainville, Conn.
Westinghouse Electric & Mfg. Co., Mansfield, O.

SWITCHES, TIME

● Gleason-Avery, Inc., Auburn, N. Y.
Guardian Electric Mfg. Co., Chicago, Ill.
● Mercoide Corp., Chicago, Ill.
Paragon Electric Co., Chicago, Ill.
● Penn Electric Switch Co., Des Moines, Ia.
Rhodes, Inc., M. H., New York City.
Sangamo Electric Co., Springfield, Ill.
Spencer Thermostat Co., Attleboro, Mass.
Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.
Tork Clock Co., Inc., Mt. Vernon, N. Y.
Ward Leonard Electric Co., Mt. Vernon, N. Y.

TEES, FURNACE PIPE

See Fittings and Accessories, Furnace Pipe

TEMPERATURE CONTROLS

See Thermostats

TEMPERATURE RECORDERS

See Recorders, Temperature

TINPLATE

See Sheets, Tin

TIPS, DAMPER

See Clips and Tips, Damper

THERMOMETERS, INDICATING

Bristol Co., Waterbury, Conn.
Brown Instrument Co., Div. of Minneapolis-Honeywell Reg. Co., Philadelphia, Pa.
Consolidated Ashcroft Hancock Co., Inc., Bridgeport, Conn.
Cooper Oven Thermometer Co., Pequabuck, Conn.
Fee & Stemwedel, Inc., Chicago, Ill.
● Friez & Sons, Inc., Julien P., Baltimore, Md.
H-B Instrument Co., Inc., Philadelphia, Pa.
● Illinois Testing Laboratories, Inc., Chicago, Ill.
Leeds & Northrup Co., Philadelphia, Pa.
Moeller Instrument Co., Brooklyn, N. Y.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Uehling Instrument Co., Paterson, N. J.

THERMOSTATS

● Automatic Products Co., Milwaukee, Wis.
● Barber-Colman Co., Rockford, Ill.
Bristol Co., Waterbury, Conn.
● Cook Electric Co., Chicago, Ill.
● Detroit Lubricator Co., Detroit, Mich.
Dunn, Inc., Struthers, Philadelphia, Pa.
● Friez & Sons, Inc., Julien P., Baltimore, Md.
General Controls Co., San Francisco, Cal. and Cleveland, O.
● Gleason-Avery, Inc., Auburn, N. Y.
Johnson Service Co., Milwaukee, Wis.
H-B Instrument Co., Inc., Philadelphia, Pa.
Hart Mfg. Co., Hartford, Conn. (Direct Break).
McCorkle Co., D. H., Berkeley, Calif.
● Mercoide Corp., Chicago, Ill.
● Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
National Regulator Co., Chicago, Ill.
● Penn Electric Switch Co., Des Moines, Ia.
● Perfex Controls Co., Milwaukee, Wis.
Pioneer Heat Regulator Corp., Dayton, O.
Powers Regulator Co., Chicago, Ill.
Robertshaw-Thermostat Co., Youngwood, Pa.
● Russell Electric Co., Chicago, Ill.
Sheer Co., H. M., Quincy, Ill.
Spencer Thermostat Co., Attleboro, Mass.
Tagliabue Mfg. Co., Brooklyn, N. Y.
United Electric Controls Co., South Boston, Mass.
● White Mfg. Co., St. Paul, Minn.

THERMOSTATS, HEAT ACCELERATED OR ANTICIPATING

● Cook Electric Co., Chicago, Ill.
● Detroit Lubricator Co., Detroit, Mich.
● Friez & Sons, Inc., Julien P., Baltimore, Md.

- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Penn Electric Switch Co., Des Moines, Ia.
- Perfex Controls Co., Milwaukee, Wis.
- Russell Electric Co., Chicago, Ill.
- Spencer Thermostat Co., Attleboro, Mass.

THROUGH WALL FLASHINGS*See Flashings, Through Wall***TIME SWITCHES***See Switches, Time***TIMERS, ELECTRICAL**

- Dunn, Inc., Struthers, Philadelphia, Pa.
- Guardian Electric Mfg. Co., Chicago, Ill.
- Penn Electric Switch Co., Des Moines, Ia.
- Russell Electric Co., Chicago, Ill.
- Spencer Thermostat Co., Attleboro, Mass.
- Welding Timer Mfg. Co., Newark, N. J. (Welding).
- Zenith Electric Co., Inc., Chicago, Ill.

TINNING FLUXES*See Compounds, Tinning***TOOLS, METAL WORKERS'**

- Champion Tool Co., Los Angeles, Cal. (Crimper).
- Crescent Tool Co., Jamestown, N. Y.
- Greene Tweed Co., New York City.
- Grobet File Corp. of America, New York City.
- Miller Rubber Co., Inc., Akron, O.
- National Machine Tool Co., Racine, Wis.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Pencilsharp Awl & Tool Co., Evansville, Ind. (Scratch Awls).
- Poe, Ralph W., Canton, Ill.
- Rock River Machine Co., Inc., Janesville, Wis.
- Skillsaw, Inc., Chicago, Ill.
- Stanley Rule & Level Plant, New Britain, Conn.
- Whitney Mfg. Co., W. A., Rockford, Ill.
- Whitney Metal Tool Co., Rockford, Ill.

TOOLS, ROOFERS'

- Aeroll Burner Co., Inc., West New York, N. J. (Military Pots).
- Elermann Floor Scraper Co., Brooklyn, N. Y. (Tar).
- Littleford Bros., Cincinnati, O.
- Milcor Steel Co., Milwaukee, Wis.
- Niagara Machine & Tool Works, Buffalo, N. Y.
- Peck, Stow & Wilcox Co., Southington, Conn.
- Pencilsharp Awl & Tool Co., Evansville, Ind.

TOPS, CHIMNEY*See Caps and Tops, Chimney***TORCHES, BRAZING, CUTTING, WELDING, OXY-ACETYLENE**

- Air Reduction Sales Co., New York City.
- Bastian-Blessing Co., Chicago, Ill.
- Bernz Co., Inc., Otto, Rochester, N. Y. (Brazing)
- Burdett Mfg. Co., Chicago, Ill.
- Callite Product Co., Union City, N. J.
- Gasweld & Airway, Inc., Chicago, Ill.
- Harris Calorific Co., Cleveland, O.
- Imperial Brass Mfg. Co., Chicago, Ill.
- Linde Air Products Co., New York City.
- Milburn Co., Alexander, Baltimore, Md.
- Miller Equipment Co., Cincinnati, O.
- Modern Engineering Co., St. Louis, Mo.
- Sight Feed Generator Co., Richmond, Ind.
- Smith Welding Equipment Corp., Minneapolis, Minn.
- Torchweld Equipment Co., Chicago, Ill.
- Welding Apparatus Co., Chicago, Ill.

TORCHES, SOLDERING

- Bernz Co., Inc., Otto, Rochester, N. Y.
- Clayton & Lambert Mfg. Co., Detroit, Mich.
- Detroit Torch & Mfg. Co., Detroit, Mich.
- Diener Mfg. Co., Geo. W., Chicago, Ill.
- Everhot Mfg. Co., Maywood, Ill.
- Gasweld & Airway, Inc., Chicago, Ill.
- Harris Calorific Co., Cleveland, O.
- Ideal Commutator Dresser Co., Sycamore, Ill.
- Imperial Brass Mfg. Co., Chicago, Ill.
- Johnson Gas Appliance Co., Cedar Rapids, Ia.
- Milburn Co., Alexander, Baltimore, Md.
- Miller Equipment Co., Cincinnati, O.
- Sight Feed Generator Co., Richmond, Ind.
- Smith Welding Equipment Corp., Minneapolis, Minn.
- Torchweld Equipment Co., Chicago, Ill.
- Turner Brass Works, Sycamore, Ill.
- Wall Mfg. Supply Co., P., Pittsburgh, Pa.
- Welding Apparatus Co., Chicago, Ill.

TRANSFORMERS, LOW VOLTAGE

- American Transformer Co., Newark, N. J.
- Barber-Colman Co., Rockford, Ill.
- Cook Electric Co., Chicago, Ill.
- Detroit Lubricator Co., Detroit, Mich.
- Friez & Sons, Inc., Julien P., Baltimore, Md.
- General Controls Co., San Francisco, Cal.
- Jefferson Electric Co., Bellwood, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Russell Electric Co., Chicago, Ill.
- Taylor-Winfield Corp., Warren, O.
- Wagner Electric Corp., St. Louis, Mo.
- Webster Electric Co., Racine, Wis.
- White Mfg. Co., St. Paul, Minn.

TRANSMISSION DRIVES*See Belts and Pulleys***TRIM, ORNAMENTAL***See Moulding and Trim, Ornamental***TUBING, COPPER**

- American Brass Co., Waterbury, Conn.
- Bridgeport Brass Co., Bridgeport, Conn.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Hussey & Co., C. G., Pittsburgh, Pa.
- Imperial Brass Mfg. Co., Chicago, Ill.
- Revere Copper & Brass, Inc., New York City.
- Streamline Pipe & Fittings, Div. of Mueller Brass Co., Port Huron, Mich.
- Wolverine Tube Co., Detroit, Mich.

UNITS, AIR CONDITIONING*See Air Conditioning Units***VACUUM CLEANERS FOR FURNACES***See Cleaners, Vacuum, Furnace***VALVES, GAS PRESSURE REGULATING**

- Atlas Valve Co., Newark, N. J.
- Barber Gas Burner Co., Cleveland, O.
- Bryant Corp., C. L., Cleveland, O.
- Bryant Heater Co., Cleveland, O.
- Detroit Lubricator Co., Detroit, Mich.
- Fisher Governor Co., Marshalltown, Ia.
- Fox Engineering Co., Boston, Mass.
- General Controls Co., San Francisco, Cal. and Cleveland, O.
- Hotstream Heater Co., Cleveland, O.
- Mercoid Corp., Chicago, Ill.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Payne Furnace & Supply Co., Beverly Hills, Cal.
- Pittsburgh Equitable Meter Co., Pittsburgh, Pa.
- Roberts-Gordon Appliance Corp., Buffalo, N. Y.
- Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.

VALVES, HUMIDIFIER, WATER LEVEL

- Automatic Humidifier Co., Cedar Falls, Ia.
- Chandler Co., Cedar Rapids, Ia.
- Detroit Lubricator Co., Detroit, Mich.
- Fisher Governor Co., Marshalltown, Ia.
- Humidity Headquarters, Cleveland, O.
- McDonnell & Miller, Chicago, Ill.
- Maid-O'-Mist, Inc., Chicago, Ill.
- Monmouth Products Co., Cleveland, O.
- Parks-Cramer Co., Fitchburg, Mass.
- Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.
- Skuttle Co., J. L., Detroit, Mich.
- Supreme Electric Products Corp., Rochester, N. Y.
- Turney Corp., Muskegon, Mich.
- Universal Blower Co., Birmingham, Mich.
- Wisconsin Humidifier Co., Milwaukee, Wis.

VALVES, SOLENOID

- Alco Valve Co., Inc., St. Louis, Mo.
- Automatic Products Co., Milwaukee, Wis.
- Automatic Switch Co., New York City.
- Barber-Colman Co., Rockford, Ill.
- Columbus Humidifier Co., Columbus, O. (One-inch water).
- Cutler-Hammer, Inc., Milwaukee, Wis.
- Detroit Lubricator Co., Detroit, Mich.
- Electric Valve Mfg. Co., Inc., New York City.
- Electromatic Corp., Chicago, Ill.
- General Controls Co., San Francisco, Cal., and Cleveland, O.
- General Electric Co., Schenectady, N. Y.
- Guardian Electric Mfg. Co., Chicago, Ill.
- McCorkle Co., D. H., Berkeley, Cal.
- Mercoid Corp., Chicago, Ill.
- Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Payne Furnace & Supply Co., Beverly Hills, Cal.
- Perfex Controls Co., Milwaukee, Wis.
- Russell Electric Co., Chicago, Ill.
- Supreme Electric Products Corp., Rochester, N. Y.

VENETIAN BLINDS*See Blinds, Venetian***VENTILATING FANS***See Fans, Ventilating***VENTILATORS, CEILING**

- Airmaster Corp., Chicago, Ill.
- American Blower Corp., Detroit, Mich.
- Auer Register Co., Cleveland, O.
- Autovent Fan & Blower Co., Chicago, Ill.
- Best Register Co., Milwaukee, Wis.
- Burt Mfg. Co., Akron, O.
- Champion Blower & Forge Co., Lancaster, Pa.
- Danzer Metal Works, Inc., Hagerstown, Md.
- Decatur Iron & Steel Co., Decatur, Ala.
- Falstrom Co., Passaic, N. J.
- Gillian Mfg. Co., Detroit, Mich.
- Hart & Cooley Mfg. Co., Chicago, Ill.
- Hudson Equipment Corp., Minneapolis, Minn.
- Lamneck Products, Inc., Columbus, O.
- Martin Metal Mfg. Co., Wichita, Kan.
- Milcor Steel Co., Milwaukee, Wis.
- Miller & Doing, Inc., Brooklyn, N. Y.
- Tiffin Art Metal Co., Tiffin, O.
- Tuttle & Bailey, Inc., New Britain, Conn.
- United States Register Co., Battle Creek, Mich.

VENTILATORS, MUSHROOM

- Aeolus Dickinson, Chicago, Ill.
- American Blower Corp., Detroit, Mich.
- Best Register Co., Milwaukee, Wis.
- Burt Mfg. Co., Akron, O.
- Falstrom Co., Passaic, N. J.
- Knowles Mushroom Ventilator Co., New York City.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- Tuttle & Bailey, Inc., New Britain, Conn.

VENTILATORS, ROOF, FAN

- Aeolus Dickinson, Chicago, Ill.
- Air Controls, Inc., Cleveland, O.
- Airmaster Corp., Chicago, Ill.
- Allen Corp., Detroit, Mich.
- American Blower Corp., Detroit, Mich.
- American Coolair Corp., Jacksonville, Fla.
- American Foundry & Furnace Co., Bloomington, Ill.
- American-Larson Ventilating Co., Pittsburgh, Pa.
- Arex Co., Chicago, Ill.
- Autovent Fan & Blower Co., Chicago, Ill.
- Bishop & Babcock Sales Co., Cleveland, O.
- Blower Application Co., Milwaukee, Wis.
- Burt Mfg. Co., Akron, O.
- Century Fan & Ventilator Corp., New York City.
- Champion Blower & Forge Co., Lancaster, Pa.
- Clarage Fan Co., Kalamazoo, Mich.
- Electrovent Fan & Mfg. Co., Chicago, Ill.
- Falstrom Co., Passaic, N. J.
- Fingles, Inc., W. A., Baltimore, Md.
- General Regulator Corp., Chicago, Ill.
- Goethel Co., Alfred C., Milwaukee, Wis.
- Hirschman Co., Inc., W. F., Buffalo, N. Y.
- Howes Co., S. M., Charlestown, Boston, Mass.
- Ilg Electric Ventilating Co., Chicago, Ill.
- International Engineering, Inc., Dayton, O.
- Iona Ventilator Co., Inc., Philadelphia, Pa.
- Jamar Co., Walker, Duluth, Minn.
- Johnson Fan & Blower Corp., Chicago, Ill.
- Jordan & Co., Paul R., Indianapolis, Ind.
- Lau Blower Co., Dayton, O.
- Marathon Electric Mfg. Corp., Wausau, Wis.
- Myers Electric Co., Pittsburgh, Pa.
- New York Blower Co., Chicago, Ill.
- Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
- Reed Unit-Fans, Inc., New Orleans, La.
- Royal Ventilator Co., Philadelphia, Pa.
- Russell Electric Co., Chicago, Ill.
- Schwitzer-Cummins Co., Indianapolis, Ind.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Viking Air Conditioning Corp., Cleveland, O.
- Western Rotary Ventilator Co., Inc., Los Angeles, Cal.
- Wing Mfg. Co., L. J., New York City.

VENTILATORS, ROOF, GRAVITY

- Accurate Mfg. Works, Chicago, Ill.
- Aeolus Dickinson, Chicago, Ill.
- Airtherm Mfg. Co., St. Louis, Mo.
- Allen Corp., Detroit, Mich.
- American Foundry & Furnace Co., Bloomington, Ill.
- American-Larson Ventilating Co., Pittsburgh, Pa.
- American Sheet Metal Works, New Orleans, La.
- Anderson Mfg. Co., Des Moines, Ia.
- Arex Co., Chicago, Ill.
- Berger Bros. Co., Philadelphia, Pa.
- Burt Mfg. Co., Akron, O.
- Century Fan & Ventilator Corp., New York City.
- Chicago Metal Mfg. Co., Chicago, Ill.

- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Clay Equipment Corp., Cedar Falls, Ia.
- Danzer Metal Works, Inc., Hagerstown, Md.
- Day Co., The, Minneapolis, Minn.
- Decatur Iron & Steel Co., Decatur, Ala.
- Drummond Sheet Metal Works, Wichita, Kan.
- Edwards Mfg. Co., Inc., Cincinnati, O.
- Falstrom Co., Passaic, N. J.
- Fingles, Inc., W. A., Baltimore, Md.
- General Sheet Metal Works, Inc., Bridgeport, Conn.
- Globe Ventilator Co., Troy, N. Y.
- Goethel Co., Alfred C., Milwaukee, Wis.
- Hirschman Co., Inc., W. F., Buffalo, N. Y.
- Howes Co., S. M., Charlestown, Boston, Mass.
- Hudson Equipment Corp., Minneapolis, Minn.
- International Steel Co., Evansville, Ind.
- Iona Ventilator Co., Inc., Philadelphia, Pa.
- Iwan Brothers, South Bend, Ind.
- Jamar Co., Walker, Duluth, Minn.
- Jordan & Co., Paul R., Indianapolis, Ind.
- Kernchen Co., Chicago, Ill.
- King Ventilating Co., Owatonna, Minn.
- Kleenaire Corp., Stevens Point, Wis.
- LaCrosse Steel Roofing & Corrugating Co., LaCrosse, Wis.
- Lamneck Products, Inc., Columbus, O.
- Lee & Son Co., Thomas, Cincinnati, O.
- Levw, David, New York City.
- Martin Metal Mfg. Co., Wichita, Kan.
- Mellish & Murray Co., Chicago, Ill.
- Merchant & Evans Co., Philadelphia, Pa.
- Meyer & Bro. Co., F., Peoria, Ill.
- Midwest Ventilating Works, Milwaukee, Wis.
- Milcor Steel Co., Milwaukee, Wis.
- Novy Ventilator Mfg. Co., Muskogee, Okla.
- Park City Cornice Works, Inc., Bridgeport, Conn.
- Penn Ventilating Co., Philadelphia, Pa.
- Perkins & Brown, Chicago, Ill.
- Providence Cornice Co., Providence, R. I.
- Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
- Racine Sheet Metal Works, Racine, Wis.
- Robertson Co., H. H., Pittsburgh, Pa.
- Royal Ventilator Co., Philadelphia, Pa.
- Ryniker Sheet Metal Works, Inc., Billings, Mont.
- St. Paul Corrugating Co., St. Paul, Minn.
- Schoedinger Co., F. O., Columbus, O.
- Southbridge Roofing Co., Inc., Southbridge, Mass.
- Southern States Iron Roofing Co., Savannah, Ga.
- Standard Ventilator Co., Lewisburg, Pa.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Swartwout Co., Cleveland, O.
- Tierney Rotor Ventilator Co., Minneapolis, Minn.
- Uno Ventilator Co., Cliftondale, Mass.
- Van Norden Co., E. Boston, Mass.
- Watson Co., Inc., Jas. H., Bradley, Ill.
- Western Rotary Ventilator Co., Inc., Los Angeles, Cal.
- Willis Mfg. Co., Galesburg, Ill.
- York Corrugating Co., York, Pa.

WARM AIR REGISTER SHIELDS*See Shields, Warm Air Register***WASHERS, AIR, FURNACE**

- Air Conditioning Equipment Corp., Minneapolis, Minn.
- Aladdin Heating Corp., Oakland, Cal.
- American Furnace Co., St. Louis, Mo.
- Ames Co., W. R., San Francisco, Cal.
- Arcweld Mfg. Co., Inc., Seattle, Wash.
- Bishop & Babcock Sales Co., Cleveland, O.
- Brown Sheet Iron & Steel Co., St. Paul, Minn.
- Brundage Co., Kalamazoo, Mich.
- Campbell Heating Co., Des Moines, Ia.
- Columbus Heating & Ventilating Co., Columbus, O.
- Economy Baler Co., Ann Arbor, Mich.
- Furblo Co., Hermansville, Mich.
- Gehri Co., Tacoma, Wash.
- Green Foundry & Furnace Works, Des Moines, Ia.
- Hoersting & Holtmann Co., Dayton, O.
- Kelsey Heating Co., Syracuse, N. Y.
- Lau Blower Co., Dayton, O.
- MaGill Foundry & Furnace Works, P. H., Bloomington, Ill.
- Meyer Furnace Co., Peoria, Ill.
- Mueller Furnace Co., L. J., Milwaukee, Wis.
- National Fan & Blower Corp., Chicago, Ill.
- Nelson Co., Detroit, Mich.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Premier Furnace Co., Dowagiac, Mich.
- Round Oak Co., Dowagiac, Mich.
- Spencer Air Conditioning Service, Denver, Colo.
- Spray-Wheel Air Conditioners, Inc., Denver, Colo.
- Texo Sales & Mfg. Co., Cincinnati, O.
- U. S. Air Conditioning Corp., Minneapolis, Minn.
- Waterman-Waterbury Co., Minneapolis, Minn.
- Western Blower Co., Seattle, Wash.

WASHERS, AIR, HEATING AND VENTILATING*(Capacity 4,000 c.f.m. and up)*

- American Blower Corp., Detroit, Mich.
- American Foundry & Furnace Co., Bloomington, Ill.

- Ames Co., W. R., San Francisco, Cal.
- Autovent Fan & Blower Co., Chicago, Ill.
- Bayley Blower Co., Milwaukee, Wis.
- Betz Unit Air Cooler Co., Kansas City, Mo.
- Bishop & Babcock Sales Co., Cleveland, O.
- Blower Application Co., Milwaukee, Wis.
- Buffalo Forge Co., Buffalo, N. Y.
- Campbell Heating Co., E. K., Kansas City, Mo.
- Clarage Fan Co., Kalamazoo, Mich.
- Columbus Heating & Ventilating Co., Columbus, O.
- Electrogas Furnace & Mfg. Co., San Francisco, Cal.
- Electrovent Fan & Mfg. Co., Chicago, Ill.
- Furblo Co., Hermansville, Mich.
- King Ventilating Co., Owatonna, Minn.
- MaGill Foundry & Furnace Works, P. H., Bloomington, Ill.
- Mellish & Murray Co., Chicago, Ill.
- National Fan & Blower Corp., Chicago, Ill.
- Nelson Co., Detroit, Mich.
- New York Blower Co., Chicago, Ill.
- Pacific Gas Radiator Co., Los Angeles, Cal.
- Parks-Cramer Co., Fitchburg, Mass.
- Peterson Freezerm Mfg. Co., Kansas City, Mo.
- Reliance Refrigeration Machine Co., Chicago, Ill.
- Spray-Wheel Air Conditioners, Inc., Denver, Colo.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Texo Sales & Mfg. Co., Cincinnati, O.
- Trane Co., La Crosse, Wis.
- U. S. Air Conditioning Corp., Minneapolis, Minn.
- Utility Fan & Mfg. Co., Los Angeles, Cal.
- Western Blower Co., Seattle, Wash.
- York Ice Machinery Corp., York, Pa.

WATER CIRCULATING PUMPS

See Pumps, Water Circulating

WATER COILS

See Coils, Cooling Water

WATER-PROOFING COMPOUNDS

See Compounds, Water-proofing

WATER HEATERS

See Coils, Fire Pot, Hot Water

WEATHER STRIPS, METAL

- Accurate Metal Weather Strip Co., New York City.
- Allmetal Weatherstrip Co., Chicago, Ill.
- American Metal Weather Strip Co., Grand Rapids, Mich.
- Athey Co., Chicago, Ill.
- Chamberlin Metal Weather Strip Co., Detroit, Mich.
- Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Diamond Metal Weather Strip Co., Columbus, O.
- Ideal Metal Weather Strip Co., Boulder, Colo.
- Jamar Co., Walker, Duluth, Minn.
- Johnson Metal Products Co., Erie, Pa.
- Metal Products Co., Cincinnati, O.
- Monarch Metal Weatherstrip Corp., St. Louis, Mo.
- Newman Brothers, Inc., Cincinnati, O.
- Northern Weatherstrip Co., Duluth, Minn.
- Pacific States Felt & Mfg. Co., Inc., San Francisco, Cal.
- Yardley Screen & Weather Strip Corp., Columbus, O.

WELDERS, ARC

- Agnew Electric Welder Co., Milford, Mich.
- Air Reduction Sales Co., New York City.
- Alter-Arc Mfg. Co., Lawton, Okla.
- Burke Electric Co., Erie, Pa.
- Commonwealth Mfg. Corp., Cincinnati, O.
- Crise Electric Mfg. Co., Mt. Vernon, O.
- Electric Arc Cutting & Welding Co., Newark, N. J.
- General Equipment Co., Wichita, Kan.
- General Electric Co., Schenectady, N. Y.
- Giant Grip Mfg. Co., Oshkosh, Wis.
- Hammett Mfg. Co., Kansas City, Mo. (A. C.)
- Harnischfeger Corp., Milwaukee, Wis.
- Hobart Brothers Co., Troy, O.
- Lee & Son Co., K. O., Aberdeen, S. D.
- Lincoln Electric Co., Cleveland, O.
- Maple Valley Mfg. Co., Mapleton, Ia.
- Master Welders, Kansas City, Mo. (A.C.)
- Miller Electric Mfg. Co., Appleton, Wis.
- Ohio Welder Co., Middlefield, O.
- Owen-Dyneto Corp., Syracuse, N. Y.
- Pier Equipment Mfg. Co., Benton Harbor, Mich.
- Star Electric Motor Co., Bloomfield, N. J.
- Tatro Brothers, Inc., Decorah, Ia.
- Thomson-Gibb Electric Welding Co., Lynn, Mass.
- Una Welding, Inc., Cleveland, O.
- Universal Power Corp., Cleveland, O.
- Vulcan Arc Welder Mfg. Co., St. Louis, Mo.
- Weldex, Inc., Detroit, Mich.
- Welding Apparatus Co., Chicago, Ill.
- Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
- Will-Weld Mfg. Co., Inc., Omaha, Nebr. (A.C.)
- Wilson Welder & Metals Co., Inc., North Bergen, N. J.

WELDERS, SPOT

- Acme Electric Welder Co., Huntington Park, Cal.
- Commonwealth Mfg. Corp., Cincinnati, O.
- Electric Arc Cutting & Welding Co., Newark, N. J.
- General Electric Co., Schenectady, N. Y.
- Glascok Bros. Mfg. Co., Muncie, Ind.
- Hammett Manufacturing Co., Kansas City, Mo. (Portable).
- Pier Equipment Mfg. Co., Benton Harbor, Mich.
- Steen-Dyer Mfg. Co., Kansas City, Mo.
- Taylor-Hall Welding Corp., Worcester, Mass.
- Taylor-Winfield Corp., Warren, O. (Butt and Seam)
- Thomson-Gibb Electric Welding Co., Lynn, Mass.

WELDING EQUIPMENT, OXY-ACETYLENE

- Air Reduction Sales Co., New York City.
- Bastian-Blessing Co., Chicago, Ill.
- Burdett Mfg. Co., Chicago, Ill.
- Carbo-Oxygen Co., Pittsburgh, Pa.
- Gasweld & Airway, Inc., Chicago, Ill.
- Harris Calorific Co., Cleveland, O.
- Imperial Brass Mfg. Co., Chicago, Ill.
- Linde Air Products Co., New York City.
- Milburn Co., Alexander, Baltimore, Md.
- Sight Feed Generator Co., Richmond, Ind.
- Smith Welding Equipment Corp., Minneapolis, Minn.
- Torchweld Equipment Co., Chicago, Ill.
- Victor Equipment Co., Los Angeles, Cal.
- Welding Apparatus Co., Chicago, Ill.

WELDING ROD

See Rod, Welding

WELDING TORCHES

See Torches, Brazing, Cutting, Welding

WHEELS, BLOWER

- Advance Aluminum Castings Corp., Chicago, Ill.
- Air Controls, Inc., Cleveland, O.
- American Blower Corp., Detroit, Mich.
- Autovent Fan & Blower Co., Chicago, Ill.
- Bayley Blower Co., Milwaukee, Wis.
- Buffalo Forge Co., Buffalo, N. Y.
- Champion Blower & Forge Co., Lancaster, Pa.
- Clarage Fan Co., Kalamazoo, Mich.
- Economy Electric Mfg. Co., Cicero, Ill.
- Janette Mfg. Co., Chicago, Ill.
- National Fan & Blower Corp., Chicago, Ill.
- Schwitzer-Cummins Co., Indianapolis, Ind.
- Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Torrington Mfg. Co., Torrington, Conn.
- U. S. Air Conditioning Corp., Minneapolis, Minn.
- Utility Fan & Mfg. Co., Los Angeles, Cal.
- Viking Air Conditioning Corp., Cleveland, O.

WINDOWS, HOLLOW METAL

- American Sheet Metal Works, New Orleans, La.
- Biersach & Neldermeier Co., Milwaukee, Wis.
- Falstrom Co., Passaic, N. J.
- Herrmann & Grace Co., Brooklyn, N. Y.
- International Steel Co., Evansville, Ind.
- Newman Brothers, Inc., Cincinnati, O.
- Perkinson & Brown, Chicago, Ill.
- Providence Cornice Co., Providence, R. I.
- Truscon Steel Co., Youngstown, O.
- Willis Mfg. Co., Galesburg, Ill.

WIRE, PLAIN, GALVANIZED AND COPPERED

- Allegheny Steel Co., Brackenridge, Pa. (Stainless).
- Aluminum Co. of America, Pittsburgh, Pa. (Aluminum).
- American Nickeloid Co., Peru, Ill. (Chrome, nickel coated).
- American Steel & Wire Co., Chicago, Ill.
- Bethlehem Steel Co., Bethlehem, Pa. (Plain, galvanized).
- California Wire Cloth Co., Oakland, Cal. (Cloth).
- Central Steel & Wire Co., Chicago, Ill.
- Chase Brass & Copper Co., Inc., Waterbury, Conn.
- Chicago Steel & Wire Co., Chicago, Ill.
- Columbia Steel Co., San Francisco, Cal.
- Continental Steel Corp., Kokomo, Ind. (Plain, galvanized steel)
- Copperweld Steel Co., Glassport, Pa. (Copper covered steel).
- Gulf States Steel Co., Birmingham, Ala.
- Jones & Laughlin Steel Corp., Pittsburgh, Pa.
- Ludlow-Saylor Wire Co., St. Louis, Mo. (Cloth).
- Page Steel & Wire Co., Monessen, Pa.
- Republic Steel Corp., Cleveland, O. (Steel).
- Roebbing's Sons Co., John A., Trenton, N. J.
- Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
- Townsend Co., New Brighton, Pa. (Plain and coppered).
- Western Wire & Iron Works, Inc., Chicago, Ill.
- Wheeling Metal & Mfg. Co., Wheeling, W. Va.
- Wickwire Spencer Steel Co., New York City.
- Youngstown Sheet & Tube Co., Youngstown, O.

Section of
American Artisan
 1937 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL
 AIR CONDITIONING AND SHEET METAL PRODUCTS
 [Section 3—TRADE NAMES]

A

- ABC**—Fan Bearings, Ventilators. American Blower Corp., Detroit, Mich.
- ABC**—Oil Burners. Automatic Burner Corp., Chicago, Ill.
- AC**—Bearings, Blowers, Blower Wheels. Air Controls, Inc., Cleveland, O.
- A.C.E.**—Furnace Blowers. Utility Fan & Mfg. Co., Los Angeles, Cal.
- A.G.P.**—Gas Burners. American Gas Products Corp., New York, N. Y.
- A-P**—Humidistats, Regulators, Thermostats, Valves, Automatic Products Co., Milwaukee, Wis.
- Abrasoweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Acco-Lastic**—Caulking Compounds. Accurate Metal Weather Strip Co., New York, N. Y.
- Ace**—Arc and Spot Welders. Pier Equipment Mfg. Co., Benton Harbor, Mich.
- Acidseal**—Paint. B. F. Goodrich Co., Akron, O.
- Acodin**—Air Conditioning Units, Colls. Airecon Industries, Inc., Detroit, Mich.
- Acousti-Pad**—Insulation. Burgess Battery Co., Chicago, Ill.
- Action Air**—Blowers. Brown Corp., Syracuse, N. Y.
- Adams**—Dampers, Jas. H. Watson Co., Inc., Bradley, Ill.
- Aeolus**—Gravity Roof Ventilators. Aeolus Dickinson, Chicago, Ill.
- Aeracool**—Fan Blades, Fans, Louvres, Ventilators. Myers Electric Co., Pittsburgh, Pa.
- Aeratherm**—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
- Aerocrat**—Air Conditioning Units, Blowers and Blower Units, Fans, Furnaces, Washers. W. R. Ames Co., San Francisco, Cal.
- Aeropel**—Kitchen Exhaust Fans. American Blower Corp., Detroit, Mich.
- Aeroplane**—Ventilators. Paul R. Jordan & Co., Indianapolis, Ind.
- Aeroplex**—Blowers. Bayley Blower Co., Milwaukee, Wis.
- Aeropull**—Ventilators. Paul R. Jordan & Co., Indianapolis, Ind.
- Aerovolve**—Ventilators. Knowles Mushroom Ventilator Co., New York, N. Y.
- Afoo**—Furnaces. American Furnace Co., St. Louis, Mo.
- Afoo**—Dampers, Grilles, Louvres, Quadrants, Registers. American Foundry & Furnace Co., Bloomington, Ill.
- Agathon**—Plates and Sheets. Republic Steel Corp., Cleveland, O.
- Air-Acoustic**—Insulation. Johns-Manville, New York City.
- Airco**—Electrodes and Welding Rods. Air Reduction Sales Co., New York, N. Y.
- Airco-DE**—Welding Equipment. Air Reduction Sales Co., New York, N. Y.
- Aire-Flo**—Air Conditioning Units, Blower Units. Lennox Furnace Co., Marshalltown, Iowa.
- Airfo**—Furnaces. Aladdin Heating Corp., Oakland, Cal.
- Airfoil**—Fans and Fan Blades. Aerovent Fan Co., Piqua, O.
- Airguide**—Thermometers. Fee & Stemwedel, Inc., Chicago, Ill.
- Airite**—Furnaces. Trane Co., La Crosse, Wis.
- Airklenzer**—Furnace Air Conditioning Unit. Round Oak Co., Dowagiac, Mich.
- Airline**—Furnaces. Joliet Heating Corp., Joliet, Ill.
- Airline**—Registers & Grilles. Tuttle & Bailey, Inc., New Britain, Conn.
- Airmaster**—Air Conditioning Units. Thatcher Co., Newark, N. J.
- Air-Master**—Grilles. Waterloo Register Co., Waterloo, Ia.
- Airmat**—Filters. American Air Filter Co., Inc., Louisville, Ky.
- Air-O-Matic**—Air Conditioning System, Boiler Type, Williams Oil-O-Matic Heating Corp., Bloomington, Ill.
- Air-O-Mist**—Humidifiers. Sallada Mfg. Co., Minneapolis, Minn.
- Airplex**—Filters. Davies Air Filter Corp., New York, N. Y.
- Airpyrator**—Blowers. Burnwell Corp., Allentown, Pa.
- Airseal**—Insulation. Rock Wool Products Co., Inc., Wabash, Ind.
- Airtrol**—Air Conditioning Units, J. H. McCormick & Co., Williamsport, Pa.
- Ajax**—Pipe, Roofing. Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Alabama**—Ventilators. Decatur Iron & Steel Co., Decatur, Ala.
- Alaska**—Coils. Star Radiator Co., Los Angeles, Cal.
- Albron**—Aluminum Paint. Aluminum Co. of America, Pittsburgh, Pa.
- Alco**—Roof Ventilators. Allen Corp., Detroit, Mich.
- Alcoa**—Aluminum Products. Aluminum Company of America, Pittsburgh, Pa.
- Alladin**—Arc Welders. Commonwealth Mfg. Corp., Cincinnati, O.
- All American**—Cabinet Heaters. Hayes Custer Stove Co., Bloomington, Ill.
- Almetal**—Fire Doors. Merchant & Evans Co., Philadelphia, Pa.
- Alnor**—Thermometers. Illinois Testing Laboratories, Inc., Chicago, Ill.
- Alumbrite**—Paint. Thompson & Co., Pittsburgh, Pa.
- Aluminweld**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Always Reliable**—Soldering Furnaces, Torches. Otto Bernz Co., Inc., Rochester, N. Y.
- Ambrac**—Sheets, Welding Rod. American Brass Co., Waterbury, Conn.
- Amco**—Flux. American Solder & Flux Co., Philadelphia, Pa.
- Amco**—Nozzles. Grinnell Co., Inc., Providence, R. I.
- American**—Draft Gages. Consolidated Ashcroft Hancock Co., Inc., Bridgeport, Conn.
- American**—Furnaces. Ryniker Sheet Metal Works, Inc., Billings, Mont.
- American**—Furnaces, Heaters. American Foundry & Furnace Co., Bloomington, Ill.
- American**—Smoke Pipe Dampers. Griswold Mfg. Co., Erie, Pa.
- Amirglass**—Air Filters. Amirton Co., New York City.
- Am-Fe-Co**—Blower Units. American Machine Products Co., Marshalltown, Iowa.
- Anaconda**—Copper and Brass Products. American Brass Co., Waterbury, Conn.
- Anchor**—Roofing Paint. A. Wilhelm Co., Reading, Pa.
- Anchor Brand**—Nails, Rivets. Townsend Co., New Brighton, Pa.
- Anchor-Kolstoker**—Domestic Stokers. Anchor Stove & Range Co., New Albany, Ind.
- Anderson**—Spray Nozzles. B. F. Sturtevant Co., Hyde Park, Mass.
- Anode**—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
- Anti-Pluvius**—Skylights. G. Drouve Co., Fairfield, Conn.
- Apco**—Caulking Compounds, Roofing Paint. Asphalt Products Co., Syracuse, N. Y.
- Apex**—Dampers, Quadrants. Ohio Products Co., Cleveland, O.
- Apollo**—Roofing. Carnegie-Illinois Steel Co., Pittsburgh, Pa.
- Appoloy**—Copper Steel. Apollo Steel Company, Apollo, Pa.
- Aqua Bar**—Furnace Cement. Continental Products Co., Euclid, O.
- Arco**—Air Conditioning Units, Air Filters, Cleaners. American Radiator Co., New York, N. Y.
- Arco-Vecto**—Heaters. American Radiator Co., New York, N. Y.
- Arex-Austor**—Ventilators. Arex Co., Chicago, Ill.
- Arex**—Louvres. Arex Co., Chicago, Ill.
- Aristocrat**—Fans. Torrington Mfg. Co., Torrington, Conn.
- Aristocrat**—Registers. Auer Register Co., Cleveland, O.
- Armco**—Plates, Sheets. American Rolling Mill Co., Middletown, O.
- Armorize**—Paint. Carter Paint Co., Liberty, Ind.
- Arrow**—Ventilators. Uno Ventilator Co., Cliftondale, Mass.
- Art**—Shingles. Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
- Art**—Faces. Wooster Art Wood, Inc., Wooster, O.
- Artcraft**—Furnace Blowers. Chicago Steel Furnace Co., Chicago, Ill.
- Asco**—Relays, Switches, Valves. Automatic Switch Co., New York, N. Y.

Aspro—Water - proofing Paint. Asphalt Products Co., Syracuse, N. Y.
Atomist—Humidifiers. American Foundry & Furnace Co., Bloomington, Ill.
Automatic Butler—Stokers. Butler Mfg. Co., Kansas City, Mo.
Automatic Drip—Humidifiers. Automatic Humidifier Co., Cedar Falls, Iowa.
Automatic June—Humidifiers, Valves, Monmouth Products Co., Cleveland, O.
Automatik—Furnaces. Premier Furnace Co., Dowagiac, Mich.

B

BB—Fittings and Accessories. Berger Bros. Co., Philadelphia, Pa.
B-W—Relays, Switches. Bender Warrick Corp., Birmingham, Mich.
Badger—Machines, Metal Workers' Tools, Pumps. Rock River Machine Co., Inc., Janesville, Wis.
Ball Bearing—Damper Quadrants. Parker-Kalon Corp., New York, N. Y.
Balmi-Aire—Air Conditioning Units. U. S. Air Conditioning Corp., Minneapolis, Minn.
Barber—Gas Burners. Barber Gas Burner Co., Cleveland, O.
Barcol—Motors. Barber Colman Co., Rockford, Ill.
Bard—Air Conditioning Units, Furnaces. Bryan Plumbing & Heating Co., Bryan, O.
Barry—Couplings, Pulleys. R. & J. Dick Co., Inc., Passaic, N. J.
Bead—Furnace Chain. Bead Chain Mfg. Co., Bridgeport, Conn.
Beaver—Insulation. Certain-teed Products Corp., New York, N. Y.
Beehive—Roofing. Samuel Cabot, Inc., Boston, Mass.
Beloit—Machines, Punches, Tools. Hendley & Whittemore Co., Beloit, Wis.
Benco—Oil Burners. W. M. Bennett Corp., Omaha, Nebr.
Benefactor—Furnaces. Hess Warming & Ventilating Co., Chicago, Ill.
Bengal—Furnaces, Heaters. Floyd-Wells Co., Royersford, Pa.
Bennett-Allison—Oil Burners. W. M. Bennett Corp., Omaha, Nebr.
Berloy—Berger Mfg. Co., Div. Republic Steel Corp., Canton, O.
Beth-Cu-Loy—Sheets. Bethlehem Steel Co., Bethlehem, Pa.
Bethlehem Doe—Oil Burners. Bethlehem Foundry & Machine Co., Bethlehem, Pa.
Bettendorf—Oil Burners. Micro-Westco, Inc., Bettendorf, Iowa.
Big Sioux—Furnaces. Iowa Foundry Co., Sioux City, Iowa.
Bildrite—Building Insulation. Insulite Co., Minneapolis, Minn.
Black Diamond—Built-up Roofing. Barrett Co., New York, N. Y.
Black Diamond—Furnaces, Heaters. Maple City Furnace Co., Monmouth, Ill.
Blo-Matic—Stokers. Her-Born Engineering & Mfg. Co., Sandusky, O.
Blue Streak—Blowers, Heaters, Humidifiers, Washers. Western Blower Co., Seattle, Wash.
Boiler Plate—Furnaces. Williamson Heater Co., Cincinnati, O.
Bon-Air—Air Conditioning Units, Blower Units, Furnaces. Rudy Furnace Co., Dowagiac, Mich.
Boomer—Furnaces, Heaters. Hess-Snyder Co., Massillon, O.
Braden-Everedy—Furnaces, Oil Burners, Air Conditioning Units, Oil Burner Builders, Inc., Bellevue, Ia.
Branford—Oil Burners. Malleable Iron Fittings Co., Branford, Conn.
Brauer's—Dampers. A. G. Brauer Supply Co., St. Louis, Mo.

Breez-Air—Fans. Buffalo Forge Co., Buffalo, N. Y.
Brevolite—Crackle Finish Paint. Zapon-Brevolite Lacquer Co., North Chicago, Ill.
Brookcell—Metal Ceilings. Brooklyn Metal Ceiling Co., Brooklyn, N. Y.
Browne—Furnaces, Oil Burners. Phillips Heating, Ventilating & Mfg. Co., Los Angeles, Cal.
Browning—Belts, Pulleys. Ohio Valley Pulley Works Div. Browning Manufacturing Co., Inc., Maysville, Ky.
Bull Dog—Snips and Shears. Wiss & Sons Co., Newark, N. J.
Bung-Lo—Floor and Warm Air Furnaces. Geo. J. Cocking, Santa Ana, Cal.
Burke—Pumps. Decatur Pump Co., Decatur, Ill.
Burmester—Furnaces, Oil Burners. Hotentot Co., Inc., Omaha, Nebr.
Butler—Furnaces. Ramey Mfg. Co., Columbus, O.

C

C-E—Stokers. Combustion Engineering Co., Inc., New York, N. Y.
C-E Coxe—Stokers. Combustion Engineering Co., Inc., New York City.
C-E Skelly—Stokers. Combustion Engineering Co., Inc., New York City.
C-H—Relays, Switches and Valves. Cutler-Hammer, Inc., Milwaukee, Wis.
CID—Pumps. Goulds Pumps, Inc., Seneca Falls, N. Y.
Cadet—Cabinet Heaters. Independence Stove & Furnace Co., Independence, Mo.
Calorider—Humidifiers. Research Corp., New York, N. Y.
Calwico—Wire Cloth California Wire Cloth Co., Oakland, Cal.
Camel—Valves. C. L. Bryant Corp., Cleveland, O.
Capital—Furnaces, Heaters. Farris Furnace Co., Springfield, Ill.
Capitol—Air Conditioning Units, Furnaces. United States Radiator Corp., Detroit, Mich.
Capitol—Insulation. Standard Lime & Stone Co., Baltimore, Md.
Capitol—Weather Strips. Diamond Metal Weather Strip Co., Columbus, O.
Carbo—Torches. Carbo-Oxygen Co., Pittsburgh, Pa.
Carola—Heaters. Cary Mfg. Co., Wau-paca, Wis.
Case-Schaffer—Furnaces. Western Furnaces, Inc., Tacoma, Wash.
Castal—Blower Wheels. Advance Aluminum Castings Corp., Chicago, Ill.
Caulk-O-Seal—Caulking and Glazing Compounds. Calbar Paint & Varnish Co., Philadelphia, Pa.
Cel-Lux—Insulation. Norristown Magnesia & Asbestos Co., Norristown, Pa.
Cementite—Paint. Thompson & Co., Pittsburgh, Pa.
Cementkote—Paint. Tropical Paint & Oil Co., Cleveland, O.
Challenge—Furnaces. Standard Foundry & Furnace Co., DeKalb, Ill.
Chamberlin—Automatic Humidifier. Chandler Co., Cedar Rapids, Ia.
Charavay—Blowers, Fans. Hartzell Propeller Fan Co., Piqua, O.
Chicago—Brakes and Presses. Dreis & Krump Mfg. Co., Chicago, Ill.
Chief—Furnaces. Joliet Heating Corp., Joliet, Ill.
Chieftain—Cabinet Heaters. Independence Stove & Furnace Co., Independence, Mo.
Chinook—Heating Coils. Bayley Blower Co., Milwaukee, Wis.
Chinookan—Heating Coils. Bayley Blower Co., Milwaukee, Wis.
Christie—Furnace Vacuum Cleaners. Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
Chromweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Chronat—Furnace and Boiler Repairs. National Fdry. & Furnace Co., Dayton, O.
Chronotherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Cibulas—Skylights, Ventilators. General Sheet Metal Works, Inc., Bridgeport, Conn.
Circulator—Fans and Ventilators. Viking Air Conditioning Corporation, Cleveland, O.
Clamp On—Humidifier Fittings. Sallada Mfg. Co., Minneapolis, Minn.
Classic—Registers. Auer Register Co., Cleveland, O.
Cleanaire—Blower - Filters. Peerless Foundry Co., Indianapolis, Ind.
Climate-Changer—Air Conditioning Furnaces, Air Conditioning Units. Trane Co., LaCrosse, Wis.
Climate Maker—Air Conditioning Units, Furnaces. American Foundry & Furnace Co., Bloomington, Ill.
Climator—Air Conditioning Units, Blower Units, Washers. L. J. Mueller Furnace Co., Milwaukee, Wis.
Coal Master—Stoker-fired Furnace. Round Oak Co., Dowagiac, Mich.
Colonial—Blower-Filter Furnaces. Green Foundry & Furnace Works, Des Moines, Iowa.
Colonial—Registers. Auer Register Co., Cleveland, O.
Colortipt—Arc Welding Electrodes. Wilson Welder & Metals Co., Inc., North Bergen, N. J.
Columbus—Ventilators. F. O. Schoedinger Co., Columbus, O.
Combustioneer—Stokers. Steel Products Engineering Co., Springfield, O.
Comet—Fans, Ventilators. New York Blower Co., Chicago, Ill.
Comfort—Furnaces. J. B. Foote Foundry Co., Fredericktown, O.
Comfort—Furnaces. Standard Furnace & Supply Co., Omaha, Nebr.
Comfortaire—Air Conditioning Units. Joliet Heating Corp., Joliet, Ill.
Comfortaire—Stokers. Hamilton Automatic Stoker Corp., Hamilton, O.
Comfortmaker—Air Conditioning Units, Furnaces. Joliet Heating Corp., Joliet, Ill.
Comfort Master—Air Conditioning Units. Thatcher Co., Newark, N. J.
Comfortrol—Air Conditioning Units, Blowers and Blower Units, Furnaces, Humidifiers, Washers. Waterman - Waterbury Co., Minneapolis, Minn.
Compact—Air Conditioning Units, Blowers. Bishop & Babcock Sales Co., Cleveland, O.
Compass—Belts. Goodyear Tire & Rubber Co., Akron, O.
Conco-Mastoker—Stokers. Sampsel Stoker Corp., Mendota, Ill.
Condor—Belts. Manhattan Rubber Mfg. Div. of Raybestos - Manhattan, Inc., Passaic, N. J.
Controlaire—Furnaces. "Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.
Control-O-Gas—Valves. Payne Furnace & Supply Co., Beverly Hills, Cal.
Convactor—Furnace. L. J. Mueller Furnace Co., Milwaukee, Wis.
Coolair—Blowers, Fans. American Cool-air Corp., Jacksonville, Fla.
Coppercote—Copper Paint. American Coppercote, Inc., New York City.
Copperior—Sheets. Superior Sheet Steel Co., Canton, O.

Cop-B-Loy—Copper Bearing Steel Sheets. Wheeling Steel Corp., Wheeling, W. Va.
Corinco—Insulation. Cork Insulation Co., Inc., New York, N. Y.
Coroaire—Heaters. Corozone Air Conditioning Corp., Cleveland, O.
Crawford—Furnaces. Walker & Pratt Mfg. Co., Boston, Mass.
Crescent—Oil Burners. Caloroil Burner Corp., Hartford, Conn.
Crescent—Skylights, Ventilators. American Sheet Metal Works, New Orleans, La.
Crescent—Ventilators. F. Meyer & Bro. Co., Peoria, Ill.
Crimpedge—Eaves Trough, Gutters. Milcor Steel Co., Milwaukee, Wis.

D

D-Q—Furnace Vacuum Cleaners. Densmore-Quinlan Co., Kenosha, Wis.
Dadco—Automatic Damper. Dutcher Heating Co., Canton, Mass.
Dallaire—Air Conditioning Units, Blowers and Blower Units, Furnaces. Dall Steel Products Co., Lansing, Mich.
Daptoblu—Gas Burners. Beck Engineering Combustion Kompany, St. Louis, Mo.
Dayton—Air Conditioning Units. International Engineering, Inc., Dayton, O.
Defecto—Ventilators. The Day Co., Minneapolis, Minn.
Delco Heat—Air Conditioning Units, Fans, Furnaces, Oil Burners. Delco-Frigidaire Conditioning Div., General Motors Sales Corporation, Dayton, O.
DeLuxe—Air Conditioning Furnaces. Williamson Heater Co., Cincinnati, O.
DeLuxe—Ozonizers. Corozone Air Conditioning Corp., Cleveland, O.
Dens-Pac—Asbestos Cement. Norristown Magnesia & Asbestos Co., Norristown, Pa.
Dependable—Paint. Heath & Milligan Mfg. Co., Chicago, Ill.
Dial Damper—Draft Regulators. Parker-Kalon Corp., New York City.
Diamond—Compounds. Thompson & Co., Pittsburgh, Pa.
Diamond—Smoke Pipe Dampers. Adams Co., Dubuque, Ia.
Diamond H—Relays, Switches, Thermostats. Hart Mfg. Co., Hartford, Conn.
Dickbelt—Flat Belts. R. & J. Dick Co., Passaic, N. J.
Dickinson—Dampers, Scuppers, Ventilators. Aeolus Dickinson, Chicago, Ill.
Dickrops—V-type Belts. R. & J. Dick Co., Passaic, N. J.
Doe—Oil Burners. Bethlehem Foundry & Machine Co., Bethlehem, Pa.
Double Diamond—Humidistats, Psychrometers, Humidity and Temperature Recorders, Relays, Switches, Thermometers. H-B Instrument Company, Philadelphia, Pa.
Double Duty—Filters. Independent Air Filter Co., Chicago, Ill.
Dover-Imperial—Eaves Trough Hangers. Ohio Wire Products Co., Dover, O.
Dow—Pipe. Sterling Foundry Co., Sterling, Ill.
Dowaglac—Furnaces. Rudy Furnace Co., Dowaglac, Mich.
Draftmaster—Regulators. Piatt Products Corp., Lansing, Mich.
Draft-O-Stat—Draft Regulators. Hotstream Heater Company, Cleveland, O.
Dreadnaught—Soldering Furnaces, Torches. P. Wall Mfg. Supply Co., Pittsburgh, Pa.

Dridrum—Filters. American Air Filter Co., Inc., Louisville, Ky.
Drifilter—Filters. American Air Filter Co., Inc., Louisville, Ky.
Dri-Lap—Roofing. Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Dri-N-Tite—Cement. A. C. Horn Co., Long Island City, N. Y.
Drou-Ve-Lite—Skylights. G. Drouve Co., Fairfield, Conn.
Dual-Air—Ventilators. General Regulator Corp., Chicago, Ill.
Dualator—Air Conditioning Units. Bryant Heater Co., Cleveland, O.
Dul-Kote—Sheets. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.
Dunco—Relays, Switches, Thermostats and Timers. Struthers Dunn, Inc., Philadelphia, Pa.
Duo-Therm—Cabinet Heaters, Oil Burners, Furnaces. Motor Wheel Corp., Lansing, Mich.
Duplex—Flashings. Chase Brass & Copper Co., Inc., Waterbury, Conn.
Duplex—Furnace Vacuum Cleaners. Ramey Mfg. Co., Columbus, O.
Dura—Furnaces, Heaters. Barry Furnace Co., Hamilton, O.
Dur-A-Ble—Furnaces. "Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.
Durimet—Sheets. Duriron Co. Inc., Dayton, O.
Duronz—Sheets. Bridgeport Brass Co., Bridgeport, Conn.
DustStop—Filters. Owens-Illinois Glass Co., Toledo, O.
Dux-Bac—Shingles. Milcor Steel Co., Milwaukee, Wis.
Dux-Sulation—Insulation, Duct and Sound Deadening. Grant Wilson, Inc., Chicago, Ill.
Dwedox—Welding Rod. Central Steel & Wire Co., Chicago, Ill.

E

E-Z-Hung—Eaves Trough. Jas. H. Watson Co., Inc., Bradley, Ill.
Eagle—Air Filters, Duct Insulation. The Felters Company, Inc., Boston, Mass.
Eaglesfield—Wood Faces. Eaglesfield Ventilator Co., Indianapolis, Ind.
Earle—Ventilators. Berger Bros. Co., Philadelphia, Pa.
Easy-Flu—Welding Rod. Handy & Harmon, New York, N. Y.
Easy-Slip—Eaves Trough and Gutters. La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Economy—Air Conditioning Units, Heaters. International Heater Co., Utica, N. Y.
Economy—Blow Pipe Hoods. Kirk & Blum Mfg. Co., Cincinnati, O.
Economy—Registers. Auer Register Co., Cleveland, O.
Economy—Stokers. Christensen Machine Co., Salt Lake City, Utah.
Economy—Ventilators. Arex Co., Chicago, Ill.
Edmanco—Ceilings, Shingles, Sheet Metal Products. Edwards Mfg. Co., Inc., Cincinnati, O.
Emco—Louvers, Skylights, Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.
Ekcco—Fans, Furnaces, Washers. E. K. Campbell Heating Co., Kansas City, Mo.
Elastikote—Paint. Tropical Paint & Oil Co., Cleveland, O.
Electric Janitor—Regulators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Electrik-Ice—Refrigerating Compressors. Uniflow Mfg. Company, Erie, Pa.

Electro—Sheet Roofing. American Brass Co., Waterbury, Conn.
Electro Way—Fans. Ward Mfg. Co., Detroit, Mich.
Electrozone—Ozonizers. Triox Eng. Co., St. Louis, Mo.
Elite—Registers. Auer Register Co., Cleveland, O.
Emco—Valves. Pittsburgh Equitable Meter Co., Pittsburgh, Pa.
Emerald Cord—Belts. Goodyear Tire & Rubber Co., Akron, O.
Enamelite—Duct Insulation. Presstite Engineering Co., St. Louis, Mo.
Enduro—Sheets. Republic Steel Corp., Cleveland, O.
Epco—Perforated Metals. Erdle Perforating Co., Rochester, N. Y.
Equator—Heaters. Lennox Furnace Co., Marshalltown, Iowa.
Esico—Electric Soldering Coppers. Electric Soldering Iron Co., Inc., New York, N. Y.
Esikmo—Coils. Star Radiator Co., Los Angeles, Cal.
Eternium—Paint. Barrett Co., New York City.
Eureka—Furnaces. Home Stove Co., Indianapolis, Ind.
Evansway—Furnaces. George Evans Corp., Moline, Ill.
Evco—Valves. Electric Valve Mfg. Co., New York, N. Y.
Everdur—Plates, Sheets, Structural Shapes, Welding Rod. American Brass Co., Waterbury, Conn.
Everedy—Humidifiers, Oil Burners. Oil Burner Builders, Inc., Bellevue, Ia.
Everlast—Air Conditioning Units, Furnaces. Pacific Gas Radiator Co., Los Angeles, Cal.

F

FAU—Forced Air Furnace Unit. Payne Furnace & Supply Co., Beverly Hills, Cal.
FXE—Underfeed Stokers. Flynn & Emrich Co., Baltimore, Md.
Fabrikated—Grilles, Registers. Independent Register Co., Cleveland, O.
Fairweather—Air Conditioning Units, Blowers and Blower Units, Washers. Furblo Co., Hermansville, Mich.
Falco—Sheets. Fairmount Aluminum Co., Fairmont, W. Va.
Farquaire—Air Conditioning Units, Blower Units. Farquhar Furnace Co., Wilmington, O.
FarQuar—Furnaces. Farquhar Furnace Co., Wilmington, O.
Faultless—Furnaces. Faultless Heater Corp., Cleveland, O.
Faultless—Furnaces, Heaters. Standard Furnace & Supply Co., Omaha, Nebr.
Favorite—Furnace and Smoke Pipe Fittings and Accessories. Williamson Heater Co., Cincinnati, O.
Featherfin—Coils. L. J. Wing Mfg. Co., New York, N. Y.
F Electric—Fan Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.
Ferrocilad—Building Insulation. Truscon Steel Co., Youngstown, O.
Ferrocrafft—Grilles. Tuttle & Bailey, Inc., New Britain, Conn.
Ferro-Therm—Insulation. American Flange & Mfg. Co., Inc., New York, N. Y.
Ferroweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Fibrofelt—Insulation. Union Fibre Co., Inc., Winona, Minn.
Filteraire—Air Filters. Wilson & Co., Chicago, Ill.
Filtered Aire—Blowers and Blower Units. American Foundry & Furnace Co., Bloomington, Ill.

Findlay—Stokers. Bluffton Mfg. Co., Findlay, O.
Pine Air—Air Conditioning Units. Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.
Firecrete—Refractories. Johns-Manville, New York, N. Y.
Fireite—Cement. Johns-Manville, New York, N. Y.
Fire-King—Stokers. Sinker-Davis Co., Indianapolis, Ind.
Fire Tender—Stokers. Holcomb & Hoke Mfg. Co., Indianapolis, Ind.
Pirma—Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.
Fitchburg—Oil Burners. E. W. Skinner Co., Fitchburg, Mass.
Pitrite—Conductor, Eaves Trough and Gutter Fittings and Accessories, Skylight Lifts, Snow Guards, Ventilators. David Levow, New York, N. Y.
Fitzgibbonsaire—Air Conditioning Unit. Fitzgibbons Boiler Co., Inc., New York City.
Fixit—Cement. National Mfg. Corp., Tonawanda, N. Y.
Fleetweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Flexarc—Arc Welders. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Floey—Solder. Merchant & Evans Co., Philadelphia, Pa.
Fluid Heat—Air Conditioning Units, Furnaces, Oil Burners. Anchor Post Fence Co., Baltimore, Md.
Forbes Syphonaire—Ventilators. Western Rotary Ventilator Co., Inc., Los Angeles, Cal.
Forbes Tri-Peller—Fans. Western Rotary Ventilator Co., Inc., Los Angeles, Cal.
Fosco—Cornices, Metal Ceilings, Skylights, Etc. F. O. Schoedinger Co., Columbus, O.
Franklin—Stokers. Columbus Metal Products, Inc., Columbus, O.
Freeflo—Grilles. Trane Co., LaCrosse, Wis.
Free-Man—Stokers. Illinois Iron & Bolt Co., Chicago, Ill.
Freeport—Oil Burners. Holtum Mfg. Co., Freeport, Ill.
Freezem—Blowers. Peterson Freezem Mfg. Co., Kansas City, Mo.
Front End—Paint. Barrett Co., New York, N. Y.
Front Bank—Furnaces. Liberty Foundry Co., St. Louis, Mo.
Furnastender—Steel Products Engineering Co., Springfield, O.
Furnastoker—Stokers. Steel Products Engineering Co., Springfield, O.
Fyr-feeder—Stokers. American Coal Burner Company, Chicago, Ill.

G

G. E.—Air Conditioning Units, Controls, Motors, Welders. General Electric Co., New York City and Schenectady, N. Y.
G & M Stokermatic—Stokers. The Stokermatic Co., Salt Lake City, Utah.
G-M—Cabinets, Casings, Faces, Grilles, Louvres, Shutters, Perforated Metals, Ornamental Mouldings and Trim, Registers, Register Shields, Metal Stampings, Ventilators. Gillian Mfg. Co., Detroit, Mich.
G & O—Heat Transfer Sections. G & O Mfg. Co., New Haven, Conn.
Garland—Furnaces, Heaters, Repairs. Detroit-Michigan Stove Co., Detroit, Mich.

Garriok—Regulators. Hays Corp., Michigan City, Ind.
Gar-Wood—Air Conditioning Furnaces and Units. Gar Wood Industries, Inc., Detroit, Mich.
Gas-Era—Furnaces. L. J. Mueller Furnace Co., Milwaukee, Wis.
Gastite—Furnaces. Waterman - Waterbury Co., Minneapolis, Minn.
Gem—Furnaces. Robinson Furnace Co., Chicago, Ill.
Gem—Soldering Furnaces. Burgess Soldering Furnace Co., Columbus, O.
Gen-Arc—Arc Welders. General Equipment Co., Wichita, Kan.
Genasco—Cement, Paint, Shingles, Waterproofing Compounds. Barber Asphalt Co., Philadelphia, Pa.
Genasco Trinidad—Roofing. Barber Asphalt Co., Philadelphia, Pa.
General—Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.
Generator—Coils. Hotstream Heater Co., Cleveland, O.
Genil—Oil Burner. Nu-Way Corp., Rock Island, Ill.
Genuine Detroit—Controls. Detroit Lubricator Co., Detroit, Mich.
Giant Nite—Fans, Ventilators. Russell Electric Co., Chicago, Ill.
Gibraltar—Heaters. P. H. McGill Foundry & Furnace Works, Bloomington, Ill.
Gilbarco—Furnaces, Air Conditioning Units. Gilbert & Barker Mfg. Co., Springfield, Mass.
Gilt Edge—Flat Belts. J. E. Rhoads & Sons, Philadelphia, Pa.
Giltedge—Furnaces. Schwab Furnace & Mfg. Co., Cedar Grove, Wis.
Gimco—Insulation. General Insulating & Mfg. Co., Alexandria, Ind.
Globe—Eaves Trough and Gutters, Roofing, Sheets Shingles and Tile. New Port Rolling Mill Co., Newport, Ky.
Globe—Roofing Sheets. Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Globe Sizzler—Walter Heater Coils. Globe Machinery & Supply Co., Des Moines, Iowa.
Gohl—Eaves Trough & Gutters, Roofing. Newport Rolling Mill Co., Newport, Ky.
Golden Rod—Air Conditioning Units, Blowers. F. Jaden Mfg. Co., Inc., Hastings, Nebr.
Golden Star—Furnaces, Ridge Rolls and Ridging. J. M. & L. A. Osborn Co., Cleveland, O.
Goss—Humidistats. W. R. Ripley Co., Tacoma, Wash.
Graylite—Building and Duct Insulation. Insulite Co., Minneapolis, Minn.
Gulfsteel—Nails, Plates, Ridge Rolls and Ridging, Roofing, Sheets, Structural Shapes, Wire. Gulf States Steel Co., Birmingham, Ala.
Gulf Stream—Furnaces. Perfect Burner Co., Lynn, Mass.

H

H & C—Chain, Clips and Tips, Faces, Grilles, Pulleys, Quadrants, Registers, Regulators, Ventilators. Hart & Cooley Mfg. Co., Chicago, Ill.
Haals—Louvers. American Sheet Metal Works, New Orleans, La.
Hairbestos—Insulation. Wilson & Co., Inc., Chicago, Ill.
Haircraft—Insulation. Wilson & Co., Inc., Chicago, Ill.
Hallstead—Furnaces. Halsted Iron Foundry, Halsted, Pa.
Handnib—Punches. National Machine Tool Co., Racine, Wis.

Handy—Furnace and Smoke Pipe, Prefabricated Ducts and Fittings, Ventilators. F. Meyer & Bro. Co., Peoria, Ill.
Handy-Andy—Clinker Tong. Northwestern Stove Repair Co., Chicago, Ill.
Handy Change—Arc Welders. Maple Valley Mfg. Co., Mapleton, Iowa.
Handy Flux—Soldering Flux. Handy & Harmon, New York City.
Happy Thought—Heaters. Pittston Stove Co., Pittston, Pa.
Hardweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.
Health Air—Blowers, Furnaces, Humidifiers, Washers. Economy Baler Co., Ann Arbor, Mich.
Healthaire—Humidifiers. Rochester Mfg. Co., Inc., Rochester, N. Y.
Healthmaster—Air Conditioning Units, Blowers, Ducts and Fittings, Furnaces, Heaters. Chandler Co., Cedar Rapids, Iowa.
Heat-Hustler—Fans. American Foundry & Furnace Co., Bloomington, Ill.
Heat-Pak—Oil Burners. Aldrich Co., Peoria, Ill.
Heatrola—Heaters. Estate Stove Co., Hamilton, O.
Heatseal—Insulation. Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Heatset—Regulators. Automatic Humidifier Co., Cedar Falls, Ia.
Heaver—Furnaces. Danville Stove & Mfg. Co., Danville, Pa.
Heavyduty—Damper Quadrants. Parker-Kalon Corp., New York, N. Y.
Hellite—Refractories. Johns-Manville, New York, N. Y.
Hercules—Arc Welders. Commonwealth Mfg. Corp., Cincinnati, O.
Hercules—Fan Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.
Hercules—Furnaces. Johnston Gas Furnace Corp., Los Angeles, Cal.
Hercules—Heavy Duty Furnace. Lennox Furnace Co., Inc., Marshalltown, Ia.
Hermetic—Furnaces. Favorite Mfg. Co., Piqua, O.
Hero—Furnaces. Standard Foundry & Furnace Co., DeKalb, Ill.
Hero—Heaters. J. V. Patten Co., Sycamore, Ill.
Highflex—Belts. B. F. Goodrich Co., Akron, O.
Highway—Copper Iron. Apollo Steel Co., Apollo, Pa.
Hitoncast—Grilles. Tuttle & Bailey, Inc., New Britain, Conn.
Hodell—Furnace Chain. Chain Products Co., Cleveland, O.
Hoffman—Oil Burners. Shedlov Oil Burners, Inc., Minneapolis, Minn.
Hold Heat—Soldering Coppers. Turner Brass Works, Sycamore, Ill.
Hold-Heat—Air Conditioning Units, Controls, Fans, Humidifiers, Humidistats, Relays, Thermostats, Transformers. Russell Electric Co., Chicago, Ill.
Holtite—Bolts, Rivets, Screws. Continental Screw Co., New Bedford, Mass.
Home—Furnaces. Rock Island Stove Co., Rock Island, Ill.
Home—Weather Strips. Chamberlin Metal Weather Strip Co., Detroit, Mich.
Hot Blast—Soldering Furnaces and Torches. Turner Brass Works, Sycamore, Ill.
Hotco—Air Conditioning Units, Furnaces, Oil Burners. Hotentot Co., Inc., Omaha, Nebr.
Hot-Kold—Furnaces. Edwards Mfg. Co., Inc., Cincinnati, O.
Hot Spot—Electric Welders. Acme Electric Welder Co., Huntington Park, Cal.

Hot Wave—Coils. Rudy Furnace Co., Dowagiac, Mich.

Hoyt—Roofing. National Lead Co., New York, N. Y.

Huber—Overfeed Stokers. Flynn & Emrich Co., Baltimore, Md.

Humidair—Humidifiers, Washers. American Foundry & Furnace Co., Bloomington, Ill.

Humidiguide—Hygrometer. Taylor Instrument Companies, Rochester, N. Y.

Humidostat—Humidistats. Johnson Service Co., Milwaukee, Wis.

Humitherm—Air Conditioning Units. Grinnell Co., Inc., Providence, R. I.

Humitrol—Humidity Controls. Lewis Air Conditioners, Inc., Minneapolis, Minn.

Hydronon—Concrete Waterproofing Paint. Barrett Co., New York City.

Hydro-Proof—Water-proofing Compounds. Asphalt Products Co., Syracuse, N. Y.

Hy-Duty—Fan Bearings, Fans, Blowers, Pumps, Ventilators. Wheel s. Schwitzer-Cummins Co., Indianapolis, Ind.

Hy-Power—Furnaces. Rudy Furnace Co., Dowagiac, Mich.

Hy-Power—Snips and Shears. Wiss & Sons Co., J., Newark, N. J.

Hyro—Dampers, Handles, Punches, Regulators. Parker-Kalon Corp., New York, N. Y.

Hyttest—Paint. National Mfg. Co., Tonawanda, N. Y.

I

Ice-O-Matic—Compressors. Williams Oil-O-Matic Heating Corp., Bloomington, Ill.

Ideal—Air Conditioning Units. Norge Heating & Conditioning Div., Borg-Warner Corp., Detroit, Mich.

Ideal—Eaves Trough and Gutters, Fittings, Pipe, etc. Jas. H. Watson Co., Inc., Bradley, Ill.

Ideal—Roofing Nails. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Ideal King—Furnaces. Kansas City Furnace Co., Kansas City, Mo.

Ilgair—Fans. Ilg Electric Ventilating Co., Chicago, Ill.

Ilg-Kold—Air Conditioning Units. Ilg Electric Ventilating Co., Chicago, Ill.

Imperial—Hangers. Berger Bros. Co., Philadelphia, Pa.

In-Cel-Wood—Insulation. Cornell Wood Products Co., Chicago, Ill.

Inco—Welding Rod. International Nickel Co., Inc., New York City.

Independent—Cabinet Heaters. Independence Stove & Furnace Co., Independence, Mo.

Indian—Furnaces. Rudy Furnace Co., Dowagiac, Mich.

IngAcad—Sheets. Ingersoll Steel & Disc Co., Chicago, Ill.

Insa-Lute—Furnace Cement. Sauereisen Cements Co., Pittsburgh, Pa.

Ins-Light—Building and Duct Insulation. Insulite Co., Minneapolis, Minn.

Interlock—Conductor Pipe. Milcor Steel Co., Milwaukee, Wis.

Invisible Joint—Metal Ceilings. Milcor Steel Co., Milwaukee, Wis.

Ironset—Furnace Cement. Fireline Stove & Furnace Lining Co., Chicago, Ill.

Ironton—Gas Burners, Heaters. Continental Stove Corp., Ironton, O.

Isl City—Registers. Rock Island Register Co., Rock Island, Ill.

J

J-M—Insulation, Roofing. Johns-Manville, New York, N. Y.

J.M.C.—Oil Burners. Johnson Mfg. Co., Waterloo, Iowa.

Jack Frost—Insulation. Barrett Co., New York City.

Janitrol—Air Conditioning Units, Furnaces, Gas Burners. Surface Combustion Corp., Toledo, O.

Jennings—Pumps. Nash Engineering Co., South Norwalk, Conn.

Jewel—Furnaces, Heaters, Repairs. Detroit-Michigan Stove Co., Detroit, Mich.

Jiffee—Coils. Hotstream Heater Co., Cleveland, O.

Jointite—Insulation. Mundet Cork Corp., New York, N. Y.

Jordan Aero—Ventilators. Paul R. Jordan & Co., Indianapolis, Ind.

Juneaire—Air Conditioning Units, Furnaces. American Foundry & Furnace Co., Bloomington, Ill.

Juniata—Soldering Flux. Geo. W. Diener Mfg. Co., Chicago, Ill.

Junior—Ozonizers. Corozone Air Conditioning Corp., Cleveland, O.

Justrite—Duct Fittings. Corbman Bros., Inc., Philadelphia, Pa.

K

K.S.V.'s—Ventilators. Kernchen Co., Chicago, Ill.

KableKord—Belts. L. H. Gilmer Co., Philadelphia, Pa.

Kant Klog—Nozzles. Howell Manufacturing Co., Kansas City, Mo.

Kant Krash—Roof Strainers. Grand Rapids Wire Products Co., Grand Rapids, Mich.

Kelsey-Bradley—Furnaces. Kelsey Heating Co., Syracuse, N. Y.

Kentucky—Eaves Trough and Gutters, Roofing, Sheets. Newport Rolling Mill Co., Newport, Ky.

Kero-Therm—Cabinet Heaters. Motor Wheel Corp., Heater Div., Lansing, Mich.

Keystone—Heaters. J. V. Patten Co., Sycamore, Ill.

Keystone—Sheets. Carnegie Illinois Steel Corp., Pittsburgh, Pa.

Klixon—Controls, Switches, Thermostats, Timers. Spencer Thermostat Co., Attleboro, Mass.

Kitchenaire—Fans. Allen Corp., Detroit, Mich.

Knock-Out—Arc Welding Electrodes, Welding Rod, Arc Welders. K. O. Lee & Son Co., Aberdeen, S. D.

Knox—Smoke Pipe. Waterloo Register Co., Waterloo, Ia.

Kom-Pak—Filters. Independent Air Filter Co., Chicago, Ill.

Konditioner—Air Conditioning Units. Kool-Kleen Air Conditioner Co., Sioux City, Ia.

Konical—Ventilators. Milcor Steel Co., Milwaukee, Wis.

Kooler-Aire—Blower-Washer Combinations. U. S. Air Conditioning Corp., Minneapolis, Minn.

Koppax—Paint. Koppers Products Co., Pittsburgh, Pa.

KruKo—Furnaces. Kruse Co., Inc., Indianapolis, Ind.

Kuehn's—Gutters, Ridge Rolls and Ridging. Milcor Steel Co., Milwaukee, Wis.

Kwiklok—Humidifier Fittings. Humidity Headquarters, Cleveland, O.

Kwikturn—Humidifier Fittings. Humidity Headquarters, Cleveland, O.

L

L. A.—Motors. Louis Allis Co., Milwaukee, Wis.

L & N—Instruments. Leeds & Northrup Co., Philadelphia, Pa.

L & R—Conductor Pipe. Lamb & Ritchie Co., Cambridge, Mass.

L-E—Flexible Couplings. Lovejoy Flexible Coupling Co., Chicago, Ill.

L-U—Gravity Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

La Condishundaire—Air Conditioning Units. Merrill Co., Inc., Boston, Mass.

Lakeside—Blowers. Furblo Co., Hermansville, Mich.

Lastik Wampum—Cement, Paint. Lastik Products Co., Inc., Pittsburgh, Pa.

Lau—Blowers, Blower-Filter-Washer Combinations. Lau Blower Co., Dayton, O.

Laurel—Repairs. Detroit-Michigan Stove Co., Detroit, Mich.

Lawson—Heaters. Continental Stove Corp., Ironton, O.

Leader—Oil Burners. Pressure Oil Burners, Inc., York, Pa.

Lehigh—Furnaces, Heaters. Pittston Stove Co., Pittston, Pa.

LeRoy—Fan and Gravity Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

Liberty—Paint. Carter Paint Co., Liberty, Ind.

Lifetime—Furnace Pipe Fittings & Accessories. Campbell Heating Co., Des Moines, Ia.

Lightweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Lima—Stokers. John R. Carnes, Inc., Lima, O.

Lincoln—Furnaces. American Foundry & Furnace Co., Bloomington, Ill.

Linc-Weld—Motors. Lincoln Electric Co., Cleveland, O.

Linoboard—Insulation. Union Fibre Co., Inc., Winona, Minn.

Linofelt—Insulation. Union Fibre Co., Inc., Winona, Minn.

Lipman—Air Conditioning Units, Coils. General Refrigeration Sales Co., Beloit, Wis.

Liquidelastigum—Paint. Barrett Co., New York City.

Little Blacksmith—Punches. J. F. Kidder Mfg. Co., Inc., Burlington, Vt.

Little Giant—Time Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.

Little Janitor—Regulators. Tillery's Little Janitor Clock Co., Newark, N. J.

Lienroc—Fire Doors. Cornell Iron Works, Inc., Long Island City, N. Y.

Lo-Blast—Gas Conversion Burners. National Machine Works, Chicago, Ill.

Lo-Boy—Stokers. Whiting Corp., Harvey, Ill.

Lockjoint—Stove Pipe. Milcor Steel Co., Milwaukee, Wis.

LokJoint—Building Insulation. Insulite Co., Minneapolis, Minn.

Lornate—Chimney Caps & Tops, Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

LoStoker—Stokers. Detroit Stoker Co., Detroit, Mich.

Luco—Acid Brushes, Compounds, Flux, solder. Thos. F. Lukens Metal Co., Philadelphia, Pa.

Luminall—Paint. National Mfg. Co., Tonawanda, N. Y.

Lumino—Paint. Koppers Products Co., Pittsburgh, Pa.

M

M & E—Compressors, Solder. Merchant & Evans Co., Philadelphia, Pa.

M & H—Zinc Sheets. Matthiessen & Hegeler Zinc Co., LaSalle, Ill.

M & M—Humidifier Valves. McDonnell & Miller, Chicago, Ill.

M-VB—Humidifier Fittings. Scovill Mfg. Co., Morency-Van Buren Div., Sturgis, Mich.

Macheta—Fans and Fan Blades. Aerovent Fan Co., Piqua, O.

Mack—Heaters. J. V. Patten Co., Sycamore, Ill.

Magio—Chimney Caps and Tops. Providence Cornice Co., Providence, R. I.

Majestic—Flashings, Roofing, Skylights, Ventilators. W. A. Fingles, Inc., Baltimore, Md.

Manganwald—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Mark Time—Time Switches. M. H. Rhodes, Inc., New York, N. Y.

Martin—Dampers, Furnaces. Phillips Heating, Ventilating & Mfg. Co., Los Angeles, Cal.

Marvel—Punches. Armstrong-Blum Mfg. Co., Chicago, Ill.

Massachusetts—Blowers, Fans. Bishop & Babcock Sales Co., Cleveland, O.

Master—Cabinet Heaters. Independence Stove & Furnace Co., Independence, Mo.

Master—Controls. White Mfg. Co., St. Paul, Minn.

Master Flux—Soldering Flux. J. M. & L. A. Osborn Co., Cleveland, O.

Master Kraft—Air Conditioning Units, Oil Burners. Harvey-Whipple, Inc., Springfield, Mass.

Master Stoker—Stokers. Muncie Gear Works, Inc., Muncie, Ind.

Mastr-Lok—Pipe Fittings. Parkersburg Iron & Steel Co., Parkersburg, W. Va.

Mayflower—Air Conditioning Units, Refrigerating Compressors. Hardy Mfg. Co., Dayton, O.

Melloblu—Gas Burners. Beck Engineering Combustion Kompany, St. Louis, Mo.

Mellow—Furnaces. Liberty Foundry Co., St. Louis, Mo.

Metalace—Registers. American Foundry & Furnace Co., Bloomington, Ill.

Metalane—Metal Weather Strips. Monarch Metal Weatherstrip Corp., St. Louis, Mo.

Metallation—Insulation. Reynolds Corp., New York, N. Y.

Metal Master—Brakes, Shears, Welders. Glascock Bros. Mfg. Co., Muncie, Ind.

Met-L-All—Weather Strips. Metal Products Co., Cincinnati, O.

Midas—Spot Welders. Commonwealth Mfg. Corp., Cincinnati, O.

Midget—Ozonizers. Corozone Air Conditioning Corp., Cleveland, O.

Miles, Jr.—Propeller Furnace Fans. Henry Furnace & Foundry Co., Cleveland, O.

Milwaukee—Ventilators. Milcor Steel Co., Milwaukee, Wis.

Mistoll—Oil Burners. Wayne Oil Burner Corp., Fort Wayne, Ind.

Mistolator—Oil Burners. Automatic Burner Corp., Chicago, Ill.

Model—Furnaces, Heaters. Home Stove Co., Indianapolis, Ind.

Model A—Furnaces, Heaters. Williamson Heater Co., Cincinnati, O.

Moderne—Furnaces. Agricola Furnace Co., Inc., Gadsden, Ala.

Moderne-Aire—Furnaces. Agricola Furnace Co., Gadsden, Ala.

Modern Hearth—Furnaces. Thompson Mfg. Co., Denver, Colo.

Modernistic—Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.

Modutrol—Controls. Minneapolis-Honey-Well Regulator Co., Minneapolis, Minn.

Moistair Blended Iron—Furnaces. Round Oak Co., Dowagiac, Mich.

Moistair Boiler Plate—Furnaces. Round Oak Co., Dowagiac, Mich.

Monarch—Furnaces. Kruse & Dewenter Co., Indianapolis, Ind.

Monarch—Furnaces. Stratton & Terstegge Co., Louisville, Ky.

Monarch—Nozzles. Monarch Mfg. Works, Inc., Philadelphia, Pa.

Monorief—Furnaces, Furnace Repairs, Prefabricated Ducts. Henry Furnace & Foundry Co., Cleveland, O.

Morning Air—Furnaces. Jackson Sheet Metal Wks., Ogden, Utah.

Moto-Heat—Oil Burners. Brigham Oil Burner Co., St. Louis, Mo.

Muelleraire—Air Conditioning Units. L. J. Mueller Furnace Co., Milwaukee, Wis.

Multiclone—Collectors. Research Corp., New York, N. Y.

Multi-Panel—Filters. American Air Filter Co., Inc., Louisville, Ky.

Multi-V—Filters. Staynew Filter Corp., Rochester, N. Y.

Munro—Pipe. Martin Bros., Rochester, N. Y.

N

Nairoil—Oil Burners. National Airoil Burner Co., Philadelphia, Pa.

National—Air Conditioning Units, Washers. P. H. McGirl Foundry & Furnace Wks., Bloomington, Ill.

National—Damper Clips and Tips. U. S. Register Co., Battle Creek, Mich.

National—Furnace Repairs. National Fdry. & Furnace Co., Dayton, O.

National—Furnaces, Heaters. Excelsior Stove & Mfg. Co., Quincy, Ill.

Natroco—Paint. National Mfg. Corp., Tonawanda, N. Y.

Naturzone—Insulation. Wilson & Co., Inc., Chicago, Ill.

Nelson-Bertossa—Air Conditioning Units, Furnaces. Nelson Co., Detroit, Mich.

Nelson—Stokers. Heating Assurance, Inc., Spokane, Wash.

Nesbit—Furnaces. Standard Furnace & Supply Co., Omaha, Nebr.

New American—Smoke Pipe Dampers. Griswold Mfg. Co., Erie, Pa.

New Gibraltar—Heaters. P. H. McGirl Foundry & Furnace Wks., Bloomington, Ill.

Newmanco—Kalamein Doors, Grilles, Registers. Newman Brothers, Inc., Cincinnati, O.

Newport—Instruments. Johnson Tool Co., Inc., East Providence, R. I.

Niagara—Air Conditioning Units, Furnaces. Forest City Foundries Co., Cleveland, O.

Niagara—Metal Workers' Machinery and Tools. Niagara Machine & Tool Works, Buffalo, N. Y.

Nitroil—Nozzles. Hubbard Co., Minneapolis, Minn.

Nokol—Oil Burners. Petroleum Heat & Power Co., Stamford, Conn.

Non-Con-Dux—Cement, Insulation. Paint, Paper, Paste. Grant Wilson, Inc., Chicago, Ill.

No Noise—Blowers. American Foundry & Furnace Co., Bloomington, Ill.

Norco—Furnaces, Furnace Cement, Pipe and Fittings, Registers and Grilles, Air Conditioning, Tank Heaters, Stoves, etc. Northwestern Stove Repair Co., Chicago, Ill.

Northland—Heaters. J. V. Patten Co., Sycamore, Ill.

Northwestern—Furnaces. Western Furnaces, Inc., Tacoma, Wash.

Nor'wester—Blowers. Grand Rapids Die & Tool Co., Grand Rapids, Mich.

Norwol—Insulation. Norristown Magnesia & Asbestos Co., Norristown, Pa.

No-Sag—Register Shields. Pentecost & Craft Co., Terre Haute, Ind.

No. Streak—Registers. Rock Island Register Co., Rock Island, Ill.

Novoid—Aluminum Paint, Bases, Insulation. Cork Import Corp., New York, N. Y.

Nu-Air—Air Conditioning Units, Room Type, Summer and Year Around Blades and Fans. Meier Electric & Machine Co., Indianapolis, Ind.

Nu-Air—Ventilators. Milcor Steel Co., Milwaukee, Wis.

Nu-Alpina—Gravity Roof Ventilators. Milcor Steel Co., Milwaukee, Wis.

Nu-Dry—Furnace Cement. Pyrolite Products Co., Cleveland, O.

Nugget—Cabinet Heaters. Independence Stove & Furnace Co., Independence, Mo.

Nu-Notch—Ventilators. Knowles Mushroom Ventilator Co., New York, N. Y.

Nu-Way Evans—Warm Air Conditioners. Nu-Way Corp., Rock Island, Ill.

O

Oil-Eighty—Boiler Burner Unit. Fitzgibbons Boiler Co., Inc., New York City.

Oil Master—Furnaces. Round Oak Co., Dowagiac, Mich.

Oil-O-Matic—Oil Burners. Williams Oil-O-Matic Heating Corp., Bloomington, Ill.

Olympic—Furnaces. Washington Stove Works, Everett, Wash.

Onized—Insulation. Owens - Illinois Glass Co., Toledo, O.

Open Dome—Furnaces. American Furnace & Foundry Co., Milan, Mich.

Orient—Furnaces. Smuck-Thiele Co., Indianapolis, Ind.

Ortho-Clima—Air Conditioning Units. Fairbanks, Morse & Co., Chicago, Ill.

Oshkosh—Stokers. Leach Co., Oshkosh, Wis.

OutOWall—Registers. Rock Island Register Co., Rock Island, Ill.

Ovaltube—Gas Burners. Beck Engineering Combustion Kompany, St. Louis, Mo.

Oxweld—Welding Apparatus. Linde Air Products Co., New York, N. Y.

Ozite—Duct Insulation. American Hair & Felt Co., Chicago, Ill.

P

P. & H.—Motors. Harnischfeger Corp., Milwaukee, Wis.

P. & H. Hansen—Arc Welders. Harnischfeger Corp., Milwaukee, Wis.

Pacific—Insulation. Pacific States Felt & Mfg. Co., Inc., San Francisco, Cal.

Pacific—Furnaces. W. W. Rosebraugh Co., Salem, Ore.

Pacific Breeze—Fans. Pryne & Co., Inc., Los Angeles, Cal.

Pacific-Everlast—Air Conditioning Units, Furnaces. Pacific Gas Radiator Co., Los Angeles, Cal.

Packingless—Pumps. Chandler Co., Cedar Rapids, Ia.

Palco Bark—Insulation. Pacific Lumber Co., San Francisco, Cal.

Paramount—Flashings. Rochester Lead Works, Inc., Rochester, N. Y.

Paramount—Hollow Metal Windows. Willis Mfg. Co., Galesburg, Ill.

Parco—Skylight Lifts. Park City Cornice Works, Inc., Bridgeport, Conn.

Patrola—Heaters. J. V. Patten Co., Sycamore, Ill.

Patterson—Roofing Clips. American Sheet Metal Works, New Orleans, La.

Pebble—Grilles. American Foundry & Furnace Co., Bloomington, Ill.

Pebble—Registers. Auer Register Co., Cleveland, O.

Peerless—Blower-Filter Combinations. Peerless Electric Co., Warren, O.

Peerless—Blowers, Collectors, Washers. New York Blower Co., Chicago, Ill.

Peerless—Eaves Trough Hangers. Abbott Mfg. Co., Painesville, O.

Peninsular—Repairs. Peninsular Stove Co., Detroit, Mich.

Penco—Air Conditioning Units. Pennsylvania Furnace & Iron Co., Warren, Pa.

Penn-Mont—Slate Structural Slate Co., Pen Argyl, Pa.

Penntrol—Controls. Penn Electric Switch Co., Des Moines, Iowa.

Perfect—Furnaces, Humidifiers. Richardson & Boynton Co., New York, N. Y.

Perfect-Fit—Metal Ceilings. Milcor Steel Co., Milwaukee, Wis.

Permopad—Filters. Independent Air Filter Co., Chicago, Ill.

Perry—Damper Clips and Tips. Griswold Mfg. Co., Erie, Pa.

Petro—Oil Burners. Petroleum Heat & Power Co., Stamford, Conn.

Pexto—Metal Workers' Machines and Tools. Peck, Stow & Wilcox Co., Southington, Conn.

Pfening—Solenoid Valves. Columbus Humidifier Co., Columbus, O.

Phaeton—Heaters. Excelso Products Corp., Buffalo, N. Y.

Pioneer—Oil Burners. Scott-Newcomb, Inc., St. Louis, Mo.

Planoidal—Blower-Filter Units, Fans. Russell Electric Co., Chicago, Ill.

Plastic Cork—Duct Insulation. Prestite Engineering Co., St. Louis, Mo.

Plastic Elastigum—Cement. Barrett Co., New York City.

Plastic PB—Cement. Barrett Co., New York City.

Plastikon—Glazing Compounds. B. F. Goodrich Co., Akron, O.

Pleasant Home—Furnaces. Peerless Foundry Co., Inc., Indianapolis, Ind.

Plexiform—Blowers. Bayley Blower Co., Milwaukee, Wis.

Plicast—Refractories. Plibrico Jointless Firebrick Co., Chicago, Ill.

Plymco—Air Filters. Plymouth Cordage Co., North Plymouth, Mass.

Porcelite—Tile. Columbian Enameling & Stamping Co., Inc., Terre Haute, Ind.

Portage—Furnaces. XXth Century Heating & Ventilating Co., Akron, O.

Positive Arc—Arc Welders. Welding Apparatus Co., Chicago, Ill.

Premier—Arc Welding Electrodes, Welding Rod. American Steel & Wire Co., Chicago, Ill.

Premier—Furnace Vacuum Cleaner. Electric Vacuum Cleaner Co., Inc., Cleveland, O.

Premier—Weather Strips. American Metal Weather Strip Co., Grand Rapids, Mich.

Presstite—Furnace and Roof Cement. Prestite Engineering Co., St. Louis, Mo.

Probert—Kalamein Doors. California Cornice Works, Inc., Los Angeles, Cal.

Protection—Soldering Furnaces and Torches. Clayton & Lambert Mfg. Co., Detroit, Mich.

Protectomotor—Filters. Staynew Filter Corp., Rochester, N. Y.

Plastold—Compounds, Furnace Cement. Plastic Products Co., Detroit, Mich.

Power—Flat Belts. J. E. Rhoads & Sons, Philadelphia, Pa.

Prest-O-Lite—Oxy-Acetylene Welding Equipment. Linde Air Products Co., New York, N. Y.

Prest-O-Weld—Oxy-Acetylene Welding Equipment. Linde Air Products Co., New York, N. Y.

Protector—Snow Guards. David Levow, New York, N. Y.

Pulverzone—Stokers. American Coal Burner Co., Chicago, Ill.

Punkah—Louvers. White Co., Kelvin and Wilfred B., Boston, Mass.

Pure-Air—Furnaces. Enterprise Boiler & Tank Works, Inc., Chicago, Ill.

Pure-Aire—Blower-Filter Units. Utility Fan & Mfg. Co., Los Angeles, Cal.

Purox—Oxy-Acetylene Welding Equipment. Linde Air Products Co., New York, N. Y.

Pyrofelt—Building and Duct Insulation. The Mineral Felt Co., Toledo, O.

Q

Quaker City—Fittings and Accessories, Conductor, Eaves Trough and Gutter, Pipe. Berger Bros. Co., Philadelphia, Pa.

Quick Cleaner—Furnace Brushes. Pilley Packing & Flue Brush Mfg. Co., St. Louis, Mo.

Quiet May—Air Conditioning Furnaces, Oil Burners. May Oil Burner Corp., Baltimore, Md.

R

R. & G.—Cold Air Faces, Grilles, Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

R. & M.—Fans, Motors. Robbins & Myers, Inc., Springfield, O.

RBC—Fan Bearings. Roller Bearing Co. of America, Trenton, N. J.

R.M.C.—Burners. Rotary Mfg. Co., Los Angeles, Cal.

R-S—Gas and Oil Burners. R-S Products Corp., Philadelphia, Pa.

Rainbow Mist—Nozzles. Peterson Freezem Mfg. Co., Kansas City, Mo.

Real Host—Oil Burners. Harry C. Weiskittel Co., Inc., Baltimore, Md.

Red Band—Motors. Howell Electric Motors Co., Howell, Mich.

Redi-Wall—Eaves Trough Hangers. Abbott Mfg. Co., Painesville, O.

Redox—Paint. Thompson & Co., Pittsburgh, Pa.

Red Spindle—Dampers. Stover Mfg. & Engine Co., Freeport, Ill.

Red Top—Insulation. Owens-Illinois Glass Co., Toledo, O.

Red Top—Insulation. United States Gypsum Co., Chicago, Ill.

Red Top—Thermostats. H-B Instrument Company, Philadelphia, Pa.

Reed—Filters. American Air Filter Co., Inc., Louisville, Ky.

ReFreshaire—Winter Air Conditioning Units, Room Type. Summerheat Co., South Bend, Ind.

Rego—Oxy-Acetylene Welding Equipment. Baastian-Blessing Co., Chicago, Ill.

Relay—Filters. W. R. Ripley Co., Tacoma, Wash.

Renn—Filters. American Air Filter Co., Inc., Louisville, Ky.

Republic—Gas Conversion Burners. Autogas Corp., Chicago, Ill.

Research—Belts. Graton & Knight Co., Worcester, Mass.

Rex—Furnaces. Calkins & Pearce, Columbus, O.

Rex-Airate—Fans, Ventilators. Air Controls, Inc., Cleveland, O.

Rex-Air-Pak—Blower Units. Air Controls, Inc., Cleveland, O.

Rexoil—Air Conditioning Units, Oil Burners, Furnaces. Reif-Rexoil, Inc., Buffalo, N. Y.

Resistal—Stainless Steels. Crucible Steel Co. of America, New York City.

Rival—Copper and Zinc Straps. David Levow, New York, N. Y.

Riverside—Furnaces. Rock Island Stove Co., Rock Island, Ill.

Rocktex—Insulation. Philip Carey Co., Lockland, Cincinnati, O.

Rohaco—Pipe, Registers, Heat Savers. Roberts-Hamilton Co., Minneapolis, Minn.

Roofkoter—Paint. Tropical Paint & Oil Co., Cleveland, O.

Rotoblast—Furnaces. Moncrief Furnace Co., Atlanta, Ga.

Roto-Clone—Dust Collectors. American Air Filter Co., Inc., Louisville, Ky.

Rotojet—Nozzles. Binks Mfg. Co., Chicago, Ill.

Royal—Air Conditioning Units, Furnaces. Hart & Crouse Co., Inc., Utica, N. Y.

Royal—Caulking Compounds, Cement, Paint. A. Wilhelm Co., Reading, Pa.

Royalair—Air Conditioning Units, Furnaces. Rock Island Stove Co., Rock Island, Ill.

Royalastic—Asbestos Cement. A. Wilhelm Co., Reading, Pa.

Royalbestos—Furnace Cement. A. Wilhelm Co., Reading, Pa.

Royalseal—Asbestos Paint. A. Wilhelm Co., Reading, Pa.

Rubalt—Paint. Alfred Hague & Co., Inc., Brooklyn, N. Y.

Ruberoid-Watson—Cement, Insulation. Ruberoid Co., New York City.

Rubyfluid—Solder, Soldering Flux, Tinning Compounds. Ruby Chemical Co., Columbus, O.

S

S.A.C.—Air Conditioning Units. Standard Air Conditioning, Inc., New York, N. Y.

S-C—Furnaces. Surface Combustion Corp., Toledo, O.

S-E—Gravity Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

S-F—Arc Welding Electrodes, Soldering Coppers and Flux, Torches, Welding Rod. Sight Feed Generator Co., Richmond, Ind.

SF-Victor—Torches, Oxy-Acetylene Welding Equipment. Sight Feed Generator Co., Richmond, Ind.

S. I. S.—Cement. Barrett Co., New York City.

S-N—Air Conditioning Units, Furnaces. Scott-Newcomb, Inc., St. Louis, Mo.

Safrol—Controls. Penn Electric Switch Co., Des Moines, Ia.

St. Louis—Stoker. Ormsby-Gray Combustion Service, Inc., St. Louis, Mo.

Salmo—Cement, Insulation, Pipe Coverings. Sall Mountain Co., Chicago, Ill.

Samco—Cement. Standard Asbestos Mfg. Co., Chicago, Ill.

Sanidair—Humidifiers. U. S. Air Conditioning Corp., Minneapolis, Minn.

Sanitary—Furnaces. Smuck-Thiele Co., Indianapolis, Ind.

Satis-Fyre—Oil Burners. Shedlov Oil Burners, Inc., Minneapolis, Minn.

Savage—Stokers. Model Mfg. Co., Richmond, Va.

Schmidt—Soldering and Brazing Torches. Minn-Kota Foundry & Mfg. Co., Fargo, N. D.

Scroll-Pivoter—Snips and Shears. Wiss & Sons Co., J., Newark, N. J.

Scruplex—Ventilators. L. J. Wing Mfg. Co., New York, N. Y.

Sealdheet—Oil Burners. Calorol Burner Corp., Hartford, Conn.

Sealdslab—Duct Insulation. Insulite Co., Minneapolis, Minn.

Seal of Quality—Roofing. Columbia Steel Co., San Francisco, Cal.

Seamless—Furnaces. Waterman-Waterbury Co., Minneapolis, Minn.

Self-Cleaning—Furnaces. Moore Corp., Joliet, Ill.

Selflock—Furnace Pipe Fittings and Accessories. Milcor Steel Co., Milwaukee, Wis.

Shield-Arc—Welders. Lincoln Electric Co., Cleveland, O.

Shower-Proof—Paint. Calbar Paint & Varnish Co., Philadelphia, Pa.

Shur-Lock—Pipe. Berger Bros. Co., Philadelphia, Pa.

Silchrome—Sheets. Ludlum Steel Co., Watervliet, N. Y.

Silent—Furnace Blowers. Air Conditioning Equipment Co., Minneapolis, Minn.

Silentair—Air Conditioning Units, Blowers, Filters, Washers. Gehri Co., Tacoma, Wash.

Silent-Auburn—Air Conditioning Units Oil Burners, Furnaces. Auburn Burner Corp., Auburn, Ind.

Silent Automatic—Dampers, Louvres, Shutters. Airecon Industries, Inc., Detroit, Mich.

Silentblu—Gas Burners. Beck Engineering Combustion Kompany, St. Louis, Mo.

Sil-Phos—Welding Rod. Handy & Harmon, New York, N. Y.

Silver-Seal—Aluminum Paint. Asphalt Products Co., Syracuse, N. Y.

Simplex—Humidifiers. Henry Kraker, Holland, Mich.

Simplex—Humidifiers. Sallada Mfg. Co., Minneapolis, Minn.

Simplex—Oil Burners. Pan American Engineering Corp., Ltd., Berkeley, Cal.

Simplex—Stoker. Stoker Products, Inc., Decatur, Ill.

Simplex—Weather Strips. American Metal Weather Strip Co., Grand Rapids, Mich.

Sirocco—Air Conditioning Units, Blowers, Fans, Grilles, Washers, Wheels. American Blower Corp., Detroit, Mich.

Sixinone—Air Conditioning Units, Colls. Handelan Washer Air Co., Minneapolis, Minn.

Slip-Lock—Blower Wheels. Viking Air Conditioning Corp., Cleveland, O.

Slug-Fit—Colls. Hotstream Heater Co., Cleveland, O.

Solar—Furnaces. American Foundry & Furnace Co., Bloomington, Ill.

Solar Comfort—Air-Conditioning and Warm Air Furnaces. "Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.

Sound-Pruf—Vibration Eliminating Bases. W. D. Fabling Co., Los Angeles, Cal.

SpecO—Soldering Flux. Pfanstiehl Chemical Co., Waukegan, Ill.

Speedage—Belts. L. H. Gilmer Co., Philadelphia, Pa.

Spee Dee—Colls. Air Controls, Inc., Cleveland, O.

Sphinx—Burners, Furnaces, Humidifiers. C. L. Bryant Corp., Cleveland, O.

Spider Web—Filters. Wilson & Co., Inc., Chicago, Ill.

Spraymaker—Humidifiers. Lennox Furnace Co., Marshalltown, Iowa.

Spra-Rite—Nozzles. Binks Mfg. Co., Chicago, Ill.

Sprincolite—Pulleys. American Pulley Co., Philadelphia, Pa.

Springair—Air Conditioning Units. S. M. Howes Co., Charlestown, Boston, Mass.

Stable-Arc—Arc Welding Electrodes, Arc Welders. Lincoln Electric Co., Cleveland, O.

Stainweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Stamco—Furnace Pipe, Fittings. Cincinnati Stamping Co., Cincinnati, O.

Standard—Furnaces. Aladdin Heating Corp., Oakland, Cal.

Standard—Furnaces. Home Furnace Co., Holland, Mich.

Standard—Furnaces, Heaters. Farris Furnace Co., Springfield, Ill.

Star—Furnaces. Arcweld Mfg. Co., Inc., Seattle, Wash.

Star—Solder. Eagle-Picher Lead Co., Cincinnati, O.

Star—Soldering Furnaces. Burgess Soldering Furnace Co., Columbus, O.

Star—Ventilators. Merchant & Evans Co., Philadelphia, Pa.

Staynew—Filters. Staynew Filter Corp., Rochester, N. Y.

Stearns—Registers. Springman Metal Specialty Co., Detroit, Mich.

Sterling—Washers. Texo Sales & Mfg. Co., Cincinnati, O.

Ster-Wa-Man—Smoke Pipe Fittings and Accessories. A. G. Brauer Supply Co., St. Louis, Mo.

Stewart—Furnaces. Fuller-Warren Co., Milwaukee, Wis.

Stoker-King—Stokers. Stokers Incorporated, Detroit, Mich.

Stoker-Ola—Stokers. Advance Appliance Co., Peoria, Ill.

Stoker "X"—Stokers. Perfectaire Corp., Baltimore, Md.

Stokol—Stokers. Schwitzer-Cummins Co., Indianapolis, Ind.

Stokolair—Air Conditioning Units Schwitzer-Cummins Co., Indianapolis, Ind.

Stowe—Stokers. Johnston & Jennings Co., Cleveland, O.

Streamaire—Colls. Young Radiator Co., Racine, Wis.

Stronghold—Flat belts. J. E. Rhoads & Sons, Philadelphia, Pa.

Sunbeam—Air Conditioning Units, Blower-Filter Units, Furnaces, Heaters. Fox Furnace Co., Elyria, O.

Sunnyaire—Air Conditioning Units, Blower-Filter Units, Furnaces, Heaters. Texo Sales & Mfg. Co., Cincinnati, O.

Sunrise—Oil Burners. Kais Sunrise Works, Detroit, Mich.

Super—Fans. Holtum Mfg. Co., Freeport, Ill.

Super—Roof Flashing. Eagle-Picher Lead Co., Cincinnati, O.

Superfex—Oil Burners, Furnaces, Heaters. Perfection Stove Co., Cleveland, O.

Super Firma—Gravity Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

Superior—Air Conditioning Units, Furnaces. Pacific Gas Radiator Co., Los Angeles, Cal.

Superior—Filters, Ventilators. American Foundry & Furnace Co., Bloomington, Ill.

Superior—Furnaces. Richardson & Boynton Co., New York, N. Y.

Super Metal—Steel Sheets. Superior Sheet Steel Co., Div. Continental Steel Corp., Canton, O.

Super Red Streak—Furnace Vacuum Cleaners. National Super Service Co., Toledo, O.

Super Suction—Furnace Vacuum Cleaners. National Super Service Co., Toledo, O.

Super-X—Metal Shingles. Gulf States Steel Co., Birmingham, Ala.

Supreme—Furnaces. American Furnace & Foundry Co., Milan, Mich.

Supreme—Furnaces, Heaters. Agricola Furnace Co., Inc., Gadsden, Ala.

Surety—Furnaces. "Home Comfort" Furnace & Mfg. Co., St. Louis, Mo.

Symonds—Registers. Liberty Foundry Co., St. Louis, Mo.

Syox—Registers. Liberty Foundry Co., St. Louis, Mo.

Syphon-Air—Ventilators. F. Meyer & Bro. Co., Peoria, Ill.

T

Tafco—Air Filters. Tuttle Air Filter Co., Inc., Louisville, Ky.

Tag—Psychrometers, Recorders, Time Switches, Thermometers, Thermostats, Valves. C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.

Tag-Mono—Flue Gas Analyzers. C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.

Tag Snapon—Thermostats. C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.

Tamco—Ventilators, Wood Faces. Tiffin Art Metal Co., Tiffin, O.

Tannate—Flat Belts. J. E. Rhoads & Sons, Philadelphia, Pa.

Tatroweld—Arc Welders. Tatro Brothers, Inc., Decorah, Iowa.

Taylor—Stokers. Advanced Engineering Co., Philadelphia, Pa.

Temlok—Insulation. Armstrong Cork Products Co., Lancaster, Pa.

Tempered-Aire—Furnaces. Gar Wood Industries, Inc., Detroit, Mich.

Temtrol—Thermostats. Penn Electric Switch Co., Des Moines, Iowa.

Texrope—V-Belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Tharco—Furnace Cement. The Armstrong Company, Detroit, Mich.

Themair—Furnaces. New York Blower Co., Chicago, Ill.

Thermidair—Air Conditioning Units. E. K. Campbell Heating Co., Kansas City, Mo.

Thermo-Drip—Humidifiers. Automatic Humidifier Co., Cedar Falls, Ia.

Thermofill—Insulation. United States Gypsum Co., Chicago, Ill.

Thermogas—Air Conditioning Units. Beck Engineering Combustion Kompany, St. Louis, Mo.

Thermogrip—Soldering Coppers. Ideal Commutator Dresser Co., Sycamore, Ill.

Thermolator—Heaters. Pacific Gas Radiator Co., Los Angeles, Cal.

Thermolier—Air Conditioning Units. Grinnell Co., Inc., Providence, R. I.

"The Pacific"—Furnaces. W. W. Rosebraugh Co., Salem, Ore.

Thermofuel—Air Conditioning Units. Beck Engineering Combustion Kompany, St. Louis, Mo.

Thermus—Gravity Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

Thor—Arc Welders. Commonwealth Mfg. Corp., Cincinnati, O.

370—Paints. Thompson & Co., Pittsburgh, Pa.

Threplex—Flashing. Chase Brass & Copper Co., Inc., Waterbury, Conn.

Thriftsteel—Furnaces. Round Oak Co., Dowagiac, Mich.

Throway—Filters. American Air Filter Co., Inc., Louisville, Ky.

Tik Wheat—Pipe Covering Paste. Clark Stak-O Corp., Rochester, N. Y.

Tillers - all - Welded—Furnaces. Iowa Foundry Co., Sioux City, Iowa.

Tin-Ezy—Soldering Flux. Alumaweld Co. of America, Chicago, Ill.

Tin Loy—Tinning Compounds. Eagle-Picher Lead Co., Cincinnati, O.

Tinol—Compounds. American Solder & Flux Co., Philadelphia, Pa.

Titan—Furnaces. Standard Fdry. & Furnace Co., DeKalb, Ill.

Titelock—Fittings and Accessories for Conductor, Eaves Trough and Gutter, Furnace Pipe; Stove Pipe; Copper Roofing; Metal Shingles and Tile. Milcor Steel Co., Milwaukee, Wis.

Tobin Bronze—Welding Rod. American Brass Co., Waterbury, Conn.

Tomb Brand—Insulation. Barrett Co., New York City.

Toncan—Plates, Ridge Rolls and Ridging, Roofing, Sheets. Republic Steel Corp., Cleveland, O.

Toolweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Toridheat—Oil Burners. Cleveland Steel Products Corp., Cleveland, O.

Tornado—Furnace Vacuum Cleaners. Breuer Electric Mfg. Co., Chicago, Ill.

Torpedo—Skylights. Milcor Steel Co., Milwaukee, Wis.

Torrid—Soldering Furnaces and Torches. Geo. W. Diener Mfg. Co., Chicago, Ill.

Torrid—Furnaces. Beck Engineering Combustion Company, St. Louis, Mo.

Torrid Zone—Furnaces, Heaters. Lennox Furnace Co., Marshalltown, Ia.

Townley—Cabinet Heaters. Independence Stove & Furnace Co., Independence, Mo.

Triplex—Furnaces. Home Furnace Co., Holland, Mich.

Triplife—Furnaces. Williamson Heater Co., Cincinnati, O.

Tropico—Humidifiers. Roberts-Hamilton Co., Minneapolis, Minn.

Tungar—Arc Welder. General Electric Co., Schenectady, N. Y.

Turtle—Roofing. Samuel Cabot, Inc., Boston, Mass.

20th Century—Fan Bearings. Roller Bearing Co. of America, Trenton, N. J.

Tymit—Time Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.

U

U. S.—Blowers. J. K. Mohler Co., Ephrata, Pa.

U. S.—Faces, Fittings, Grilles, Registers. U. S. Register Co., Battle Creek, Mich.

U. S. Airco—Blowers, Washers. U. S. Air Conditioning Corp., Minneapolis, Minn.

U. S. All Steel—Furnaces. U. S. Pressed Steel Products Co., Kalamazoo, Mich.

U. S. G.—Roofing. United States Gypsum Co., Chicago, Ill.

USS—Roofing, Sheets. Carnegie-Illinois Steel Corp., Pittsburgh, Pa.

U-Loy—Sheets. Republic Steel Corp., Cleveland, O.

Uniblast—Blowers. Autovent Fan & Blower Co., Chicago, Ill.

Unicool—Air Conditioning Units. Betz Unit Air Cooler Co., Kansas City, Mo.

Unified—Air Conditioning Units. Hugo Mfg. Co., Duluth, Minn.

Uni-Fin—Warm Air Registers. Barber-Colman Co., Rockford, Ill.

Unilectric—Fans. Midwest Ventilating Works, Milwaukee, Wis.

Unishear—Power Shears. Stanley Electric Tool Div., The Stanley Works, New Britain, Conn.

Unistoker—Stokers. Detroit Stoker Co., Detroit, Mich.

Unitor—Cabinet Heaters. American Gas Products Corp., New York, N. Y.

Universal—Air Filters. Hugo Mfg. Co., Duluth, Minn.

Universal—Blowers. Universal Blower Co., Birmingham, Mich.

Universal—Blowers, Fans. Ilg Electric Ventilating Co., Chicago, Ill.

Universal—Hand Snips and Shears. Rupp Forge & Shear Co., Cleveland, O.

Unxld—Damper Quadrants. Parker-Kalton Corp., New York, N. Y.

Upson—Rivets. Republic Steel Corp., Cleveland, O.

U. S. S. Columbia—Roofing, Sheets. Columbia Steel Co., San Francisco, Cal.

Utilus—Kitchen Exhaust and Ventilating Fans. W. F. Hirschman Co., Inc., Buffalo, N. Y.

V

"V" Crimp—Roofing. W. R. Ames Co., San Francisco, Cal.

Vacu-Draft—Blowers. Muncie Gear Works, Inc., Muncie, Ind.

Valley Forge—Cement. Ehret Magnesia Mfg. Co., Valley Forge, Pa.

Vaporator—Humidifiers. Rudy Furnace Co., Dowagiac, Mich.

Varipitch—Fans. Torrington Mfg. Co., Torrington, Conn.

Velometer—Anemometers. Illinois Testing Laboratories, Inc., Chicago, Ill.

Ventura—Fans, Ventilators. American Blower Corp., Detroit, Mich.

Vernalloy—Furnace Metal. Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

Vernois—Furnaces. Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.

Verson—Brakes, Punches. Allsteel Press Co., Inc., Chicago, Ill.

Vibracork—Bases. Armstrong Cork Products Co., Lancaster, Pa.

Victor—Air Conditioning Units, Blower-Filter Units, Furnaces, Humidifiers, Stokers. Hall-Neal Furnace Co., Indianapolis, Ind.

Victor—Regulators. Safe Automatic Heat Control Co., Detroit, Mich.

Victorairs—Air Conditioning Furnaces, Units, Furnaces. Hall-Neal Furnace Co., Indianapolis, Ind.

Victor Force-Air—Fans. Victor Electric Products, Inc., Cincinnati, O.

Victor Heat Booster—Fans. Victor Electric Products, Inc., Cincinnati, O.

Victor In-Bilt—Fans. Victor Electric Products, Inc., Cincinnati, O.

Victory—Oil Burners. Caloroll Burner Corp., Hartford, Conn.

Vik-Air—Air Conditioning Units, Blowers and Blower Units, Humidifiers. Viking Air Conditioning Corp., Cleveland, O.

Vim—Belts. E. F. Houghton & Co., Philadelphia, Pa.

Vim Tred—Belts. E. F. Houghton & Co., Philadelphia, Pa.

Vortex—Furnace Vacuum Cleaners. B. F. Sturtevant Co., Hyde Park, Boston, Mass.

Vulcanite—Roofing, Roofing Cement. Certain-teed Products Corp., New York, N. Y.

Vulcatex—Caulking and Glazing Compounds. A. C. Horn Co., Long Island City, N. Y.

Vulco—V-type Belts. Gates Rubber Co., Denver, Colo.

W

Wafer—Filters. American Air Filter Co., Inc., Louisville, Ky.

Walsh—Refractories. Walsh Refractories Corp., St. Louis, Mo.

Warco—Refractories. Walsh Refractories Corp., St. Louis, Mo.

Waterbase—Furnaces, Heaters. Farris Furnace Co., Springfield, Ill.

Water-Boy—Humidifier Valves. Maid-O'-Mist, Inc., Chicago, Ill.

Waterseal—Cement, Paint. Thompson & Co., Pittsburgh, Pa.

Watertender—Humidifier Valve. J. L. Skutt Co., Detroit, Mich.

Watson—Furnaces, Heaters. Floral City Co., Monroe, Mich.

Wearweld—Arc Welding Electrodes. Lincoln Electric Co., Cleveland, O.

Weathermaker—Air Conditioning Units. Carrier Corp., Newark, N. J.

Weathermaster—Air Conditioning Units, Boiler Type. Carrier Corp., Newark, N. J.

Weather Master—Air Conditioning Units. U. S. Pressed Steel Products Co., Kalamazoo, Mich.

Weather Stabilizer—Air Conditioning Units, Furnaces, Heaters. Des Moines Steel Furnace Co., Des Moines, Ia.

Weatherwood—Insulation. United States Gypsum Co., Chicago, Ill.

Wedgbelt—Pulleys. American Pulley Co., Philadelphia, Pa.

Weir—Air Conditioning Units, Furnaces, Heaters. Meyer Furnace Co., Peoria, Ill.

Weisco—Skylight Lifts. H. Weiss & Co., New York, N. Y.

Weldit—Torches, Oxy-Acetylene Welding Equipment. Welding Apparatus Co., Chicago, Ill.

Weldite—Electrodes and Welding Rod. Chicago Steel & Wire Co., Chicago, Ill.

Wesco—Furnaces. John Westwick & Son, Inc., Galena, Ill.

Western King—Furnaces. Independence Stove & Furnace Co., Independence, Mo.

Westrite—Furnaces. Western Furnaces, Inc., Tacoma, Wash.

Wheco—Oil Burners. Westchester Home Equipment Co., Inc., Bronx, N. Y.

White Flash—Electrodes. Central Steel & Wire Co., Chicago, Ill.

Whitney—Stokers. Apex Tool Co., Inc., Bridgeport, Conn.

Whitney-Jensen—Sheet Metal Tools. Whitney Metal Tool Co., Rockford, Ill.

Wiechert—Furnaces, Heaters. St. Clair Foundry Corp., Centralia, Ill.

Wildergloss—Smoke and Stove Pipe and Fittings. Wilder Metal Co., Niles, O.

Wilson—Arc Welders. Air Reduction Sales Co., New York, N. Y.

Winair—Fans. W. F. Hirschman Co., Inc., Buffalo, N. Y.

Wind Electric—Roof Ventilators. W. F. Hirschman Co., Inc., Buffalo, N. Y.

Wind-O-Vane Jr.—Kitchen Exhaust Fans. B. F. Sturtevant Co., Hyde Park, Mass.

Winner—Registers. Auer Register Co., Cleveland, O.

Winter-Chaser—Air Conditioning Units, Furnaces, Heaters. Campbell Heating Co., Des Moines, Ia.

Winter King—Furnaces. McPherson Furnace & Supply Co., Portland, Ore.

Wizard—Furnaces. Agricola Furnace Co., Inc., Gadsden, Ala.

Wolverine—Weather Strips. American Metal Weather Strip Co., Grand Rapids, Mich.

X

XL—Metal Windows. Herrmann & Grace Co., Brooklyn, N. Y.

X-L-All—Coils, Furnaces. Deshler Foundry & Machine Works, Deshler, O.

Xit—Ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.

Y

Yager's—Flux. Alex R. Benson Co., Inc., Hudson, N. Y.

Yankee—Damper Clips and Tips. S. M. Howes Co., Charlestown, Boston, Mass.

Yoloy—Alloy Plates and Sheets. Youngstown Sheet & Tube Co., Youngstown, O.

York-Lalor—Oil Burners. York Oil Burner Co., Inc., York, Pa.

Z

Zeph-O-Lator—Air Conditioning Furnaces. Century Engineering Corp., Cedar Rapids, Ia.

Zephyr Air—Air Conditioning Units. Savage Arms Corp., New York, N. Y.

Zero—Furnace Cement and Refractories. Standard Fuel Engineering Co., Detroit, Mich.

Zincoat—Sheets. Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Z-No King—Furnaces. Oakland Foundry Co., Belleville, Ill.

Section of
American Artisan
 1937 DIRECTORY OF WARM AIR HEATING, RESIDENTIAL
 AIR CONDITIONING AND SHEET METAL PRODUCTS

[Section 4—MANUFACTURERS' ADDRESSES]

A

- A-C Mfg. Co., Inc., 417 Sherman Ave., Pontiac, Ill.
 Abbott Mfg. Co., Box 150, Painesville, O.
 Accurate Mfg. Works, 2432 Milwaukee Ave., Chicago, Ill.
 Accurate Metal Weather Strip Co., 216 E. 26th St., New York City.
 Ace Engineering Co., 1735 W. 31st St., Chicago, Ill.
 Acer & Whedon, Inc., Commercial St., Medina, N. Y.
 Acme Asbestos Covering & Flooring Co., 218 Elizabeth St., Chicago, Ill.
 ● Acme Electric Welder Co., 5619 Pacific Blvd., Huntington Park, Cal.
 ● Acme Heating & Ventilating Co., 4224 S. Lowe Ave., Chicago, Ill.
 Acme Oil Burner Co., Inc., 210 Third Ave., S. W., Cedar Rapids, Ia.
 Acme Refining Co., W. 56th & W. & L. E. Ry., Cleveland, O.
 Acme Tin Plate & Roofing Supply Co., 10th & York St., Philadelphia, Pa.
 Adams Co., E. 4th St. Ext., Dubuque, Ia.
 Adjustable Bearing Plate Co., 11 Rutger St., St. Louis, Mo.
 Advance Aluminum Castings Corp., 2742 W. 36th Pl., Chicago, Ill.
 Advance Appliance Co., 808-810 Washington St., Peoria, Ill.
 Advanced Engineering Co., Aramingo Ave. & Cumberland St., Philadelphia, Pa.
 Aeolus Dickinson, 3332-52 S. Artesian Ave., Chicago, Ill.
 ● Aerofin Corp., 850 Frelinghuysen Ave., Newark, N. J.
 Aeroil Burner Co., Inc., Park Ave. at 13th St., West New York, N. J.
 Aerovent Fan Co., 710 E. Ash St., Piqua, O.
 Agnew Electric Welder Co., 64 Thomas St., Milford, Mich.
 Agricola Furnace Co., Inc., North 12th St., Gadsden, Ala.
 ● Air Conditioning Equipment Co., 301 N. Seventh St., Minneapolis, Minn.
 Air Controls, Inc., 1935 W. 114th St., Cleveland, O.
 Air Devices Corp., 64 E. 25th St., Chicago, Ill.
 ● Airecon Industries, 2648-2654 Botsford Ave., Detroit, Mich.
 Alrmaster Corp., 140 S. Dearborn St., Chicago, Ill.
 Air-Maze Corp., Caxton Bldg., Cleveland, O.
 Air Reduction Sales Co., 60 E. 42nd St., New York City.
 Airtemp, Inc., Leo St., Dayton, O.
 Airtherm Mfg. Co., 1474 S. Vandeventer Ave., St. Louis, Mo.
 Aladdin Heating Corp., 5107 Broadway, Oakland, Cal.
 Alco Valve Co., Inc., 2628 Big Bend Blvd., St. Louis, Mo.
 Aldrich Co., 209 Hamilton St., Peoria, Ill.
 Aldrich Pump Co., Foot of Pine St., Allentown, Pa.
 Alexander Bros., 406 N. 3rd St., Philadelphia, Pa.
 Alfol Insulation Co., 1422 Chrysler Bldg., New York City.
 Allegheny Steel Co., Brackenridge, Pa.
 Allen-Bradley Co., 1335 S. Second St., Milwaukee, Wis.
 Allen Corp., 9751 Erwin, Detroit, Mich.
 Allis-Chalmers Mfg. Co., Milwaukee, Wis.
 Allis Co., Louis, 427 E. Stewart St., Milwaukee, Wis.
 Allmetal Weatherstrip Co., 229 W. Illinois St., Chicago, Ill.
 All States Roofers Equipment & Material Co., 2107 W. Lake St., Chicago, Ill.
 ● Allsteel Press Co., Inc., 12019 S. Peoria St., Chicago, Ill.
 Alter-Arc Mfg. Co., 209 B St., Lawton, Okla.
 Alton Mineral Wool Co., P. O. Box 268, Alton, Ill.
 Alumaweld Co. of America, 2442-44 South Parkway, Chicago, Ill.
 Aluminum Company of America, 801 Gulf Bldg., Pittsburgh, Pa.
 ● American Air Filter Co., Inc., 113 Central Ave., Louisville, Ky.
 American Blower Corp., 6000 Russell St., Detroit, Mich.
 ● American Brass Co., 414 Meadow St., Waterbury, Conn.
 American Chemical Paint Co., Brookside Ave., Ambler, Pa.
 American Chain Co., Inc., 929 Connecticut Ave., Bridgeport, Conn.
 American Coal Burner Co., 155 E. Superior St., Chicago, Ill.
 American Coolair Corp., 3604 Mayflower St., Jacksonville, Fla.
 American Coppercote, Inc., 480 Lexington Ave., New York, N. Y.
 American Flange & Mfg. Co., Inc., Radio City, New York City.
 ● American Foundry & Furnace Co., 915 E. Washington St., Bloomington, Ill.
 American Furnace Co., 2719-31 Delmar Blvd., St. Louis, Mo.
 American Furnace & Foundry Co., Milan, Mich.
 American Gas Products Corp., 40 W. 40th St., New York City.
 American Hair & Felt Co., 222 N. Bank Dr., Chicago, Ill.
 American-Larson Ventilating Co., 1004 Keystone Bank Bldg., Pittsburgh, Pa.
 American Machine Products Co., 207-11 Market St., Marshalltown, Ia.
 American Metal Weather Strip Co., 144 N. Division Ave., Grand Rapids, Mich.
 American Nickeloid Co., 1505 Second St., Peru, Ill.
 American Pulley Co., 4200 Wissahickon Ave., Philadelphia, Pa.
 American Radiator Co., 40 W. 40th St., New York City.
 ● American Rolling Mill Co., 730 Curtis St., Middletown, O.
 American Screw Co., 1934 Thurston Ave., Providence, R. I.
 American Solder & Flux Co., 4519 Wayne Ave., Philadelphia, Pa.
 American Steam Pump Co., 60 Capital Ave., N. E., Battle Creek, Mich.
 American Sheet Metal Works, 331 N. Alexander, New Orleans, La.
 American Steel Co., 1330 Park Bldg., Pittsburgh, Pa.
 American Steel & Wire Co., 208 S. La Salle St., Chicago, Ill.
 American Transformer Co., 192 Emmet St., Newark, N. J.
 American Wood Register Co., Novelty & Walnut Sts., Plymouth, Ind.
 American Zinc Products Co., Greencastle, Ind.
 Ames Co., W. R., 150 Hooper St., San Francisco, Cal.
 Amirton Co., 60 E. 42nd St., New York City.
 Anchor Post Fence Co., Eastern Ave. & Kane St., Baltimore, Md.
 Anchor Stove and Range Co., Third & Culbertson, New Albany, Ind.
 Anderson Mfg. Co., 511 3rd, Des Moines, Ia.
 Anderson Products, Inc., 17 Tudor St., Cambridge, Mass.
 Andes Range & Furnace Corp., 117 Evans St., Geneva, N. Y.
 Andrews Lead Co., Inc., 30-48 Greenpoint Ave., Long Island City, N. Y.
 Angell Nail & Chaplet Co., 4580 E. 71st St., Cleveland, O.
 Annis, Emmett F., 1515 Gardena St., Glendale, Cal.
 Anson Industrial Co., 55 Front St., New York City.
 Anti-Corrosive Metal Products Co., Inc., Castleton-on-Hudson, N. Y.
 Antigo Building Supply Co., Antigo, Wis.
 Apex Tool Co., Inc., 50 Remer St., Bridgeport, Conn.
 Apollo Steel Co., 609-617 Warren Ave., Apollo, Pa.
 Arco Vacuum Corp., 40 W. 40th St., New York City.
 Arcweld Mfg. Co., Inc., 3469 Third Ave. W., Seattle, Wash.
 Arex Co., 333 N. Michigan Ave., Chicago, Ill.
 Armstrong-Blum Mfg. Co., 333 N. Francisco Ave., Chicago, Ill.
 Armstrong Co., South & Post St., Detroit, Mich.
 Armstrong Cork Products Co., 992 Concord St., Lancaster, Pa.
 Armstrong Furnace Co., 1649 Olentangy River Rd., Columbus, O.
 Asphalt Products Co., Eastwood Sta., Syracuse, N. Y.
 Athens Plow Co., Athens, Tenn.
 Athey Co., 1923 S. Calumet, Chicago, Ill.
 Atlas Bolt & Screw Co., 1130 Ivanhoe Rd., Cleveland, O.
 Atlas Heating & Ventilating Co., Ltd., 557 4th St., San Francisco, Cal.
 Atlas Valve Co., 282 South St., Newark, N. J.
 Auburn Burner Corp., Auburn, Ind.
 Auburn Stoker Co., Auburn, Ind.
 ● Auer Register Co., 3608 Payne Ave., Cleveland, O.
 ● Autocrat Oil Burner Corp., 100 East Ave., N. W., Cedar Rapids, Ia.
 Autogas Corp., 2258 Diversey Ave., Chicago, Ill.
 Automatic Burner Corp., 1823 Carroll Ave., Chicago, Ill.
 ● Automatic Humidifier Co., 18th & Main Sts., Cedar Falls, Ia.
 ● Automatic Products Co., 2452 N. 32nd St., Milwaukee, Wis.
 Automatic Reclosing Circuit Breaker Co., 601 W. 5th Ave., Columbus, O.

- Automatic Stoker Corp., Indianapolis, Ind.
 Automatic Switch Co., 154 Grand St., New York City.
 •Autovent Fan & Blower Co., 1807-19 N. Kostner Ave., Chicago, Ill.

B

- Bacharach Industrial Instrument Co., 7000 Bennett St., Pittsburgh, Pa.
 Badger Mfg. Co., 106 N. Frances St., Madison, Wis.
 Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland, O.
 Baker Furnace & Cleaner Mfg. Co., 2505 Albion St., Toledo, O.
 Baker Ice Machine Co., Inc., 1509 Evans St., Omaha, Nebr.
 Baldor Electric Co., 4358 Duncan Ave., St. Louis, Mo.
 Ballard, Inc., Arthur H., 535 Commonwealth Ave., Boston, Mass.
 Balloffett Dies & Nozzle Co., Inc., 45-51 Adams St., Guttenberg, N. J.
 Bangor-Washington Slate Co., Bangor, Pa.
 Barber Co., Inc., 1600 Arch St., Philadelphia, Pa.
 •Barber-Colman Co., River & Loomis Sts., Rockford, Ill.
 •Barber Gas Burner Co., 3704 Superior Ave., Cleveland, O.
 Bardes Range & Foundry Co., E. H., 2619 Colerain Ave., Cincinnati, O.
 Barnes Metal Products Co., 4425 W. 16th St., Chicago, Ill.
 Barrett Co., 40 Rector St., New York City.
 Barrett Engineers, 1322 Warrensville Center Rd., Cleveland Heights, O.
 Barry Furnace Co., N. "B" St., Hamilton, O.
 Bartlett Mfg. Co., 3003 E. Grand Blvd., Detroit, Mich.
 Bastian-Blessing Co., 240 E. Ontario St., Chicago, Ill.
 Bayer Co., A. J., Slauson & Santa Fe Aves., Los Angeles, Cal.
 Bayley Blower Co., 1817 S. 66th St., Milwaukee, Wis.
 •Bead Chain Mfg. Co., 110 Mountain Grove St., Bridgeport, Conn.
 Beatrice Steel Tank Mfg. Co., 700-710 S. 7th St., Beatrice, Nebr.
 Beatty Machine & Mfg. Co., 932 150th St., Hammond, Ind.
 Beck Engineering Combustion Kompany, 3033 Adams St., St. Louis, Mo.
 Beckley Perforating Co., 315 North Ave., Garwood, N. J.
 Bedard Mfg. Co., 1647 Hennepin Ave., Minneapolis, Minn.
 Bell & Gossett Co., 3000 Wallace St., Chicago, Ill.
 Belmont Smelting & Refining Works, Inc., 341 Belmont Ave., Brooklyn, N. Y.
 Bender Warrick Corp., 131 Pierce, Birmingham, Mich.
 Bennett Corp., W. M., 1109 Harney St., Omaha, Nebr.
 •Benson Co., Inc., Alex R., 1040 S. Bay Rd., Hudson, N. Y.
 •Berger Bros. Co., 229-237 Arch St., Philadelphia, Pa.
 •Berger Co., L. D., 59 N. Second St., Philadelphia, Pa.
 •Berger Mfg. Co., Div. of Republic Steel Corp., 1038 Belden Ave., N. E., Canton, O.
 Berger Mfg. Div. of Truscon Steel Co., Canton, O.
 Bergstrom Mfg. Corp., Neenah, Wis.
 Bernz Co., Inc., Otto, 280 Lyell Ave., Rochester, N. Y.
 Berryman Oil Burner Co., 1304 Washington Blvd., Chicago, Ill.
 Bertsch & Co., Church St., Cambridge City, Ind.
 Best Register Co., 2005 W. Oklahoma Ave., Milwaukee, Wis.
 Bethlehem Foundry & Machine Co., W. Second St., Bethlehem, Pa.
 •Bethlehem Steel Co., Bethlehem, Pa.
 Betz Unit Air Cooler Co., 6 W. Ninth St., Kansas City, Mo.
 Beverly Throatless Shear Co., 3009 W. 110th Pl., Chicago, Ill.
 Biersach & Niedermeyer Co., 1937 N. Hubbard St., Milwaukee, Wis.
 Bignall Co., 621-623 Main St., Medina, N. Y.
 Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill.
 Bird & Son, Inc., 163 Washington St., East Walpole, Mass.
 Bishop & Babcock Sales Co., 4901 Hamilton Ave., Cleveland, O.
 Bishop Humidifier Co., 8011 Dexter Blvd., Detroit, Mich.
 Black & Decker Mfg. Co., Pennsylvania Ave., Towson, Md.
 Bliss Co., E. W., 1420 Hastings St., Toledo, O.
 Bluffton Mfg. Co., 433 W. Main Cross St., Findlay, O.
 Blower Application Co., 918 N. Fourth St., Milwaukee, Wis.
 Bodine Electric Co., 2272 W. Ohio St., Chicago, Ill.
 Bollaert, M., 3936 Rhoda Ave., Oakland, Cal.
 Bossert Corp., 1800 Lenox Ave Utica, N. Y.
 Bostwick-Goodell Co., Norwalk, O.
 Braden Engineering, Inc., 896 Elmwood Ave., Providence, R. I.
 Braden Mfg. Co., 431 N. 14th St., Terre Haute, Ind.
 Brasco Mfg. Co., Harvey, Ill.
 •Brauer Supply Co., A. G., 316 N. Third St., Louis, Mo.
 •Bremil Mfg. Co., Box 1030, Erie Pa.
 •Breuer Electric Mfg. Co., 865 Blackhawk St., Chicago, Ill.
 Bridesburg Foundry Co., Tacony & Duncan Sts., Philadelphia, Pa.
 Bridgeport Brass Co., E. Main St., Bridgeport, Conn.
 Bridgeport Chain & Mfg. Co., 964 Crescent Ave., Bridgeport, Conn.
 Bridgeport Screw Co., Bridgeport, Conn.
 Brigham Oil Burner Co., 2915 Clark Ave., St. Louis, Mo.
 •Brillion Furnace Co., Brillion, Wis.

- Bristol Co., Waterbury, Conn.
 Brooklyn Metal Ceiling Co., 283-89 Greene Ave., Brooklyn, N. Y.
 Bros Boiler & Mfg. Co., Wm., Nicollet Island, Minneapolis, Minn.
 Brown-Brockmeyer Co., Inc., 1098 Smithville Rd., Dayton O.
 Brown Corp., 213 Bellevue Ave., Syracuse, N. Y.
 Brown Instrument Co., Div. Minneapolis-Honeywell Regulator Co., Wayne & Roberts Aves., Philadelphia, Pa.
 Brown Oil Burning Equipment Co., 312-314 Massachusetts Ave., Cambridge, Mass.
 Brown Sheet Iron & Steel Co., 964 Berry Ave., St. Paul, Minn.
 Brownell Co., N. Findlay St., Dayton, O.
 Brumme Mfg. Co., 314 S. Artesian Ave., Chicago, Ill.
 Brundage Co., 246 W. Kalamazoo Ave., Kalamazoo, Mich.
 Brunner Mfg. Co., 1821 Broad St., Utica, N. Y.
 Bryan Plumbing & Heating Co., 213 W. Butler St., Bryan, O.
 Bryan Steam Corp., P. O. Box 337, Peru, Ind.
 Bryant Corp., C. L., 10511 Churchill Ave., Cleveland, O.
 Bryant Heater Co., 17825 St. Clair Ave., Cleveland, O.
 Buckeye Products Co., 7024 Vine St., Cincinnati, O.
 Budke Stamping Co., P. O. Box 96, Canonsburg, Pa.
 •Buffalo Forge Co., 497 Broadway, Buffalo, N. Y.
 Buffalo Pumps, Inc., 171 Mortimer St., Buffalo, N. Y.
 Burdett Mfg. Co., 19 N. Sheldon St., Chicago, Ill.
 Burgess Battery Co., 111 W. Monroe St., Chicago, Ill.
 Burgess Soldering Furnace Co., 292 E. Long St., Columbus, O.
 Burke Electric Co., 1201 W. 12th St., Erie, Pa.
 Burmester Gas Furnace Mfg. Co., 2117 Cumming St., Omaha, Nebr.
 Burnham Boiler Corp., 1 Main St., Irvington, N. Y.
 Burnham Stoker Co., 505 Columbia St., Vancouver, Wash.
 •Burnley Battery & Mfg. Co., Clay St., North East, Pa.
 Burnwell Corp., 125 N. Church St., Allentown, Pa.
 Burt Air Filter Corp., Grand Central Terminal, New York City.
 Burt Mfg. Co., 44 E. South St., Akron, O.
 Bush Mfg. Co., 100 Wellington St., Hartford, Conn.
 Butler Mfg. Co., 13th & Eastern, Kansas City, Mo.
 Byers Co., A. M., Clark Bldg., Pittsburgh, Pa.

C

- Cabot, Inc., Samuel, 141 Milk St., Boston, Mass.
 Calbar Paint & Varnish Co., 2620 N. Martha St., Philadelphia, Pa.
 California Cornice Works, Inc., 1620 N. Spring St., Los Angeles, Cal.
 California Wire Cloth Co., 1001 22nd Ave., Oakland, Cal.
 Calkins & Pearce, 203-205 E. Long St., Columbus, O.
 Callahan Can Machine Co., Inc., 80 Richard St., Brooklyn, N. Y.
 Callite Product Co., 540 39th St., Union City, N. J.
 Caloroll Burner Corp., 1477 Park St., Hartford, Conn.
 Campbell Heating Co., 31st and Dean, Des Moines, Ia.
 Campbell Heating Co., E. K., 2445 Charlotte St., Kansas City, Mo.
 •Canton Steel Ceiling Mfg. Co., 2280 Winfield Way, S. E., Canton, O.
 Canton Stoker Corp., 507 Andrews Pl., S. W., Canton, O.
 •Capital Furnace & Stove Repair, 229 S. Meridian St., Indianapolis, Ind.
 Carbondale Machine Corp., Worthington Ave., Harrison, N. J.
 Carbo-Oxygen Co., 221-223 Fourth Ave., Pittsburgh, Pa.
 Carey Co., Philip, Wayne Ave., Cincinnati, O.
 Carnegie-Illinois Steel Co., Carnegie Bldg., Pittsburgh, Pa.
 Carnes, Inc., John R., Greenlawn Ave. & Erie R. R., Lima, O.
 Carraway-Byrd Corp., 613 N. Pearl St., Dallas, Tex.
 Carrier Corp., 850 Frelinghuysen Ave., Newark, N. J.
 Carter-Korth Oil Burner Corp., 123 Hawthorne St., Roselle Park, N. J.
 Carter Paint Co., 310 N. Main St., Liberty, Ind.
 Cary Mfg. Co., Waupaca, Wis.
 Celotex Corp., 919 N. Michigan Ave., Chicago, Ill.
 •Central Furnace & Stove Repair Co., 3937 Olive St., St. Louis, Mo.
 Central Steel & Wire Co., 4545 S. Western Blvd., Chicago, Ill.
 Central Wire & Iron Works, 621 E. Locust St., Des Moines, Ia.
 •Century Electric Co., 1806 Pine St., St. Louis, Mo.
 •Century Engineering Corp., 213-217 Fourth Ave., S. E., Cedar Rapids, Ia.
 Century Fan & Ventilator Corp., 500 E. 134th St., New York City.
 Certain-teed Products Corp., 100 E. 42nd St., New York City.
 Chace Valve Co., W. M., 1606 Beard Ave., Detroit, Mich.
 Chain Products Co., 3910 Cooper Ave., Cleveland, O.
 Chalmers Oil Burner Co., 1234 Central Ave., Minneapolis, Minn.
 Chamberlin Metal Weather Strip Co., 1254 La Brosse, Detroit, Mich.
 Champion Blower & Forge Co., Harrisburg Ave. & Charlotte St., Lancaster, Pa.
 Champion Furnace Pipe Co., 918 S. Adams St., Peoria, Ill.

•Champion Tool Co., 356 W. 91st St., Los Angeles, Cal.
 •Chandler Co., 804 1st Ave., N. W., Cedar Rapids, Ia.
 Chapman Clay Co., Zanesville, O.
 Chapman Slate Co., 546 Main St., Bethlehem, Pa.
 Chase Brass & Copper Co., Inc., 236 Grand St., Waterbury, Conn.
 Cheney Co., 1200 Architects Bldg., 17th & Sansom Sts., Philadelphia, Pa.
 Chicago Automatic Stoker Co., Not Inc., 14 N. Clinton St., Chicago, Ill.
 Chicago Die Casting Co., 2512 W. Monroe St., Chicago, Ill.
 Chicago Furnace Supply Co., 1278 Clybourn Ave., Chicago, Ill.
 Chicago Metal Mfg. Co., 3720 S. Rockwell St., Chicago, Ill.
 Chicago Perforating Co., 2445 W. 24th Pl., Chicago, Ill.
 Chicago Pump Co., 2336 Wolfrum St., Chicago, Ill.
 Chicago Steel & Wire Co., 103rd St. & Torrence Ave., Chicago, Ill.
 •Chicago Steel Furnace Co., 7934 S. Chicago Ave., Chicago, Ill.
 Chicago Venetian Blind Co., 3105 W. 27th St., Chicago, Ill.
 Chinook, Inc., 111 Endicott-Arcade Bldg., St. Paul, Minn.
 Christensen Machine Co., 1975 S. Second West St., Salt Lake City, Utah.
 •Christie Cleaner Co., Div. of Cincinnati Sheet Metal & Roofing Co., 226-30 E. Front St., Cincinnati, O.
 Cincinnati Mfg. Co., Gest & Evans Sts., Cincinnati, O.
 Cincinnati Shaper Co., Hopple, Garrard & Elam, Cincinnati, O.
 Cincinnati Sheet Metal & Roofing Co., 230 E. Front St., Cincinnati, O.
 Cincinnati Stamping Co., 28-34 W. McMicken, Cincinnati, O.
 •Clarage Fan Co., North & Porter Sts., Kalamazoo, Mich.
 Clark Bros. Bolt Co., Milldale, Conn.
 Clark Controller Co., 1146 E. 152nd St., Cleveland, O.
 Clark, Jr., Electric Co., Jas., 600 Bergman St., Louisville, Ky.
 Clark Stek-O Corp., 1631 Dewey Ave., Rochester, N. Y.
 Clarm Mechanical Devices Co., 410 S. Elizabeth St., Lima, O.
 Clauss Shear Co., Fremont, O.
 Clay Equipment Corp., Cedar Falls, Ia.
 Clayton & Lambert Mfg. Co., 11111 French Rd., Detroit, Mich.
 Cleveland Brush Factory, Inc., 7115 Dearborn Ave., S. W., Cleveland, O.
 Cleveland Cooperative Stove Co., 2323 E. 67th St., Cleveland, O.
 Cleveland Punch & Shear Works Co., E. 40th & St. Clair Ave., Cleveland, O.
 Cleveland Steel Products Corp., 7306 Madison Ave., Cleveland, O.
 Clinton Metallic Paint Co., P. O. Box 278, Clinton, N. Y.
 Clough, A. W., 28 S. Broad St., Meriden, Conn.
 Coal Carburetor Co., Woodbridge Ave. & Thomas St., New Brunswick, N. J.
 Cocking, Geo. J., 1336 W. 5th St., Santa Ana, Cal.
 Cole Hot Blast Mfg. Co., 3108 W. 51st St., Chicago, Ill.
 Coleman Lamp & Stove Co., 2nd & St. Francis, Wichita, Kan.
 Columbia Burner Co., 1649 Dorr St., Toledo, O.
 Columbia Mills, Inc., Saginaw, Mich.
 Columbia Steel Co. (Sub. United States Steel Corp.), Russ Bldg., 235 Montgomery St., San Francisco, Cal.
 Columbian Enamelling & Stamping Co., 1536 Beech St., Terre Haute, Ind.
 Columbus Heating & Ventilating Co., 400 Dublin Ave., Columbus, O.
 Columbus Humidifier Co., 154 N. Fifth St., Columbus, O.
 Columbus Metal Products, Inc., 767 N. 4th St., Columbus, O.
 Combustion Engineering Co., Inc., 200 Madison Ave., New York City.
 Commonwealth Mfg. Corp., 4208 Davis Lane, Cincinnati, O.
 •Congress Tool & Die Co., 9034 Lumkin Ave., Detroit, Mich.
 Connors Paint Mfg. Co., Wm., 669-683 River St., Troy, N. Y.
 Consolidated Air Conditioning Corp., 114 E. 32nd St., New York City.
 Consolidated Ashcroft Hancock Co., Inc., 11 Elias St., Bridgeport, Conn.
 Continental Electric Co., Inc., 323 Ferry St., Newark, N. J.
 Continental Products Co., 1150 E. 222nd St., Euclid, O.
 Continental Rubber Works, 1900 Liberty Parkway, Erie, Pa.
 Continental Screw Co., Mt. Pleasant, New Bedford, Mass.
 Continental Steel Corp., 1108 S. Main St., Kokomo, Ind.
 Continental Stove Corp., Front & Walnut, Ironton, O.
 •Cook Electric Co., 2700 Southport Ave., Chicago, Ill.
 Cooper Oven Thermometer Co., Pequabuck, Conn.
 Copeland Refrigeration Corp., 1331 Holden Ave., Detroit, Mich.
 Copperweld Steel Co., Glassport, Pa.
 Coppus Engineering Corp., 344 Park Ave., Worcester, Mass.
 Corbin Screw Corp., 300 High St., New Britain, Conn.
 Corbman Bros., Inc., 1205 N. Fourth St., Philadelphia, Pa.
 Cork Import Corp., 330 W. 42nd St., New York City.
 Cork Insulation Co., Inc., 155 E. 44th St., New York City.
 Cornell Iron Works, Inc., 36-20 13th St., Long Island City, N. Y.
 Cornell Wood Products Co., 230 N. Michigan Ave., Chicago, Ill.
 Corozone Air Conditioning Corp., 1422 Euclid Ave., 1110 Hanna Bldg., Cleveland, O.
 Crane Co., 836 S. Michigan Ave., Chicago, Ill.
 Crary Mfg. Co., 396 N. Second St., Middleport, O.
 Crescent Tool Co., 230 Harrison St., Jamestown, N. Y.
 Crise Electric Mfg. Co., 316-320 S. Main St., Mt. Vernon, O.

Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.
 Cross Engineering Co., 160-178 Dundaff St., Carbondale, Pa.
 Crown Fuel Saver Co., Richmond, Ind.
 Crucible Steel Co. of America, 405 Lexington Ave., New York City.
 Curtis Refrigerating Machine Co., 1905 Kienlen Ave., St. Louis, Mo.
 Cutler-Hammer, Inc., N. 12th St. and W. St. Paul Ave., Milwaukee, Wis.

D

•Dall Steel Products Co., 1050 Main St., Lansing, Mich.
 Daniels Mfg. Co., Inc., Sam, Daniels Rd., Hardwick, Vt.
 Danville Stove & Mfg. Co., Danville, Pa.
 Danzer Metal Works, Inc., 101 W. Lee St., Hagerstown, Md.
 Davies Air Filter Corp., 390 4th Ave., New York City.
 Day Co., The, 2938 Pillsbury Ave., Minneapolis, Minn.
 Dayton Casting Co., Kiser & Chapel Sts., Dayton, O.
 Dayton Greenhouse Mfg. Co., P. O. Box 801, Dayton, O.
 Dayton Pump & Mfg. Co., Dayton, O.
 Dayton Rubber Mfg. Co., 2345 W. Riverview Ave., Dayton, O.
 De Bothezat Corp., Div. American Machine and Metals, Inc., 100 Sixth Ave., New York City.
 Decatur Iron & Steel Co., Decatur, Ala.
 Decatur Pump Co., 2750 Nelson Park Rd., Decatur, Ill.
 De Laval Steam Turbine Co., 300 Nottingham Way, Trenton, N. J.
 De La Vergne Engine Co. (Sales Agent for Baldwin-Southwork Corp.), Paschall P. O., Philadelphia, Pa.
 D'Elia Oil Burner Co., Inc., 145 Stratford Ave., Bridgeport, Conn.
 Delco-Frigidaire Conditioning Div., General Motors Sales Corporation, Dayton, O.
 Delco Products Corp., 329 E. First St., Dayton, O.
 Delta Stoker Co., North Chicago, Ill.
 Deming Co., 148 Aetna St., Salem, O.
 Deniston Co., 4856 S. Western Ave., Chicago, Ill.
 Densmore-Quinlan Co., 910 74th St., Kenosha, Wis.
 Deshler Foundry & Machine Works, 140-142 S. East Ave., Deshler, O.
 Des Moines Steel Furnace Co., 1718 Eleventh, Des Moines, Ia.
 •Detroit Lubricator Co., 5842 Trumbull Ave., Detroit, Mich.
 Detroit Michigan Stove Co., 6900 E. Jefferson Ave., Detroit, Mich.
 Detroit Safety Furnace Pipe Co., 5960 Second Blvd., Detroit, Mich.
 Detroit Steel Products Co., 2250 E. Grand Blvd., Detroit, Mich.
 Detroit Stoker Co., General Motors Bldg., Detroit, Mich. (Sales & Engineering); Monroe, Mich. (Main Office & Works).
 Detroit Torch & Mfg. Co., 12057 Cardoni Ave., Detroit, Mich.
 De Vilbiss Co., 296 Phillips Ave., Toledo, O.
 Devlin Mfg. Co., Thos., Burlington, N. J.
 Diamond Castings Co., Park Pl., DuBois, Pa.
 Diamond Mfg. Co., 243 W. 8th St., Wyoming, Pa.
 Diamond Metal Weather Strip Co., 650 N. 4th St., Columbus, O.
 Dick Co., Inc., R. & J., Passaic, N. J.
 Dickson Weatherproof Nail Co., P. O. Box 334, Evans-ton, Ill.
 Dieckmann Co., Ferdinand, 1182 Harrison St., Cincinnati, O.
 Diehl Mfg. Co., Trumbull St., Elizabethport, N. J.
 Diener Mfg. Co., Geo. W., 400 N. Monticello Ave., Chicago, Ill.
 Dodge Mfg. Corp., 500 S. Union St., Mishawaka, Ind.
 Dowagiac Steel Furnace Co., E. High St., Dowagiac, Mich.
 Downs-Smith Brass & Copper Co., 43-15 38th St., Long Island City, N. Y.
 •Dreis & Krump Mfg. Co., 7404 Loomis Blvd., Chicago, Ill.
 Drouve Co., G., 2082 Kings Highway, Fairfield, Conn.
 Drummond Sheet Metal Works, 121 W. First St., Wichita, Kan.
 Duckworth-Elseley Metal Products Co., 1535 Spruce St., Detroit, Mich.
 Dunn, Inc., Struthers, 139 N. Juniper St., Philadelphia, Pa.
 Durlon Co., Inc., 411 N. Findlay St., Dayton, O.
 Duro Co., 537 E. Monument Ave., Dayton, O.
 Duro Metal Products Co., 2649 N. Kildare Ave., Chicago, Ill.
 Dutcher Heating Co., 1292 Washington St., Canton, Mass.

E

Eagle-Picher Lead Co., Temple Bar Bldg., Cincinnati, O.
 Eaglesfield Ventilator Co., 920 Dorman St., Indianapolis, Ind.
 Easternoil, Inc., 133 Marginal Way, Portland, Me.
 Eckenroth, Harry L., 1935 Franklin St., San Francisco, Cal.
 Eclipse Metal Mfg. Co., Main St., Eden, N. Y.
 •Econocol Stoker Co., Division of Cotta Transmission Corp., 2340 11th St., Rockford, Ill.
 Economy Baler Co., 1020 N. Main St., Ann Arbor, Mich.
 Economy Electric Mfg. Co., 4634 W. 21st Pl., Cicero, Ill.
 Economy Pumping Machinery Co., Inc., 3431 W. 48th Pl., Chicago, Ill.
 Eddy Stoker Corp., 4717 W. North Ave., Chicago, Ill.

Edison Electrical Controls Division, Thos. A. Edison, Inc., Lakeside Ave., West Orange, N. J.
 Edwards Furnace Co., 25 East Ave., Wellsboro, Pa.
 Edwards Mfg. Co., Inc., 337 Eggleston Ave., Cincinnati, O.
 Ehret Magnesia Mfg. Co., Valley Forge, Pa.
 Elermann Floor Scraper Co., 1971 Fulton St., Brooklyn, N. Y.
 Elker Mfg. Company, Ogalla, Nebr.
 Electric Arc Cutting & Welding Co., 152 Jelliff Ave., Newark, N. J.
 Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland, O.
 Electric Furnace-Man, Inc., 7 Dey St., New York City.
 Electric Materials Co., Clay & Washington Sts., North East, Pa.
 Electric Soldering Iron Co., Inc., 342 W. 14th St., New York City.
 Electric Sprayit Co., 224 N. Broadway, Milwaukee, Wis.
 •Electric Vacuum Cleaner Co., Inc., 1734 Ivanhoe Rd., Cleveland, O.
 Electric Valve Mfg. Co., Inc., 68 Murray St., New York City.
 Electromatic Corp., 2100 S. Indiana, Chicago, Ill.
 Electroaire Corp., 1455 W. Congress St., Chicago, Ill.
 Electrogas Furnace & Mfg. Co., 2575 Bayshore Blvd., San Francisco, Cal.
 •Electrol, Inc., 934 Main Ave., Clifton, N. J.
 Elec-Tro-Matic Oil Burner Co., 487 Central Ave., Cedarhurst, L. I., N. Y.
 Electrovent Corp., 5402 Western Ave., Detroit, Mich.
 Electrovent Fan & Mfg. Co., 737 W. Washington Blvd., Chicago, Ill.
 •Elgo Shutter & Mfg. Co., 634 W. Warren Ave., Detroit, Mich.
 Ellison Draft Gage Co., 214 W. Kinzie St., Chicago, Ill.
 •Emerson Electric Mfg. Co., 1824 Washington Ave., St. Louis, Mo.
 Empire Door Co., Inc., 226 E. 144th St., New York City.
 Empire Metal Co., 820 E. Water St., Syracuse, N. Y.
 Empire Sheet & Tin Plate Co., N. Bowman St., Mansfield, O.
 Emrich Co., C., 127 W. Fulton St., Columbus, O.
 Enterprise Boiler & Tank Works, Inc., 1955 N. Long Ave., Chicago, Ill.
 Enterprise Foundry Co., E. "B" St., Belleville, Ill.
 Enterprise Oil Burner Co., 2949 18th St., San Francisco, Cal.
 Erdle Perforating Co., 171 York St., Rochester, N. Y.
 Estate Stove Co., Hamilton, O.
 Evans Corp., George, 121 37th St., Moline, Ill.
 Everhot Mfg. Co., 619 S. 10th Ave., Maywood, Ill.
 Evry-Use Products, Inc., 260 Canal St., New York City.
 Exello Oil Heating Corp., 111½ S. 24th St., Omaha, Nebr.
 Excelsior Steel Furnace Co., 118 S. Clinton St., Chicago, Ill.
 Excelsior Stove & Mfg. Co., 504-630 S. Front St., Quincy, Ill.
 Excelsior Tool and Machine Co., 31st & Ridge Ave., East St. Louis, Ill.
 Excelsior Products Corp., 65 Clyde Ave., Buffalo, N. Y.

F

Fabling Co., W. D., 722 N. Broadway, Los Angeles, Cal.
 Fafnir Bearing Co., 37 Booth St., New Britain, Conn.
 Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.
 Fairmont Aluminum Co., Fairmont, W. Va.
 Falco Furnace Co., 18 Valencia St., San Francisco, Cal.
 Falstrom Co., Main Ave. & D. L. & W. R. R., Passaic, N. J.
 Farquhar Furnace Co., 150 Owens Ave., Wilmington, O.
 Farris Furnace Co., 920-930 Enos Ave., Springfield, Ill.
 Faultless Castings Co., 222 Lora Ave., Youngstown, O.
 Faultless Heater Corp., 1220 Main Ave., N. W., Cleveland, O.
 •Favorite Mfg. Co., Young & Weber Sts., Piqua, O.
 Fedders Mfg. Co., 57 Tonawanda St., Buffalo, N. Y.
 Fee and Stemwedel, Inc., 4949 N. Pulaski Rd., Chicago, Ill.
 Felters Co., Inc., 210 South St., Boston, Mass.
 Field Mfg. Co., 2328 Nelson St., Chicago, Ill.
 Figge Co., 1617 N. Hoyne Ave., Chicago, Ill.
 Fingles, Inc., W. A., Reistertown Road at Elgin Ave., Baltimore, Md.
 Finnell Rotary Stokers, Inc., 502 East St., Elkhart, Ind.
 •Fireline Stove & Furnace Lining Co., 1800 Kingsbury St., Chicago, Ill.
 Firestone Tire & Rubber Co., 1400 S. Main St., Akron, O.
 Fisher Governor Co., 102-07 S. First St., Marshalltown, Ia.
 •Fitzgibbons Boiler Co., Inc., 101 Park Ave., New York City.
 Flemm Lead Co., Inc., Bradley Ave., Long Island City, N. Y.
 Flintkote Co., 50 W. 50th St., New York City.
 Floral City Co., 402 S. Monroe St., Monroe, Mich.
 Floyd-Wells Co., Royersford, Pa.
 Flynn & Emrich Co., 301 Holliday St., Baltimore, Md.
 Follansbee Brothers Co., 3rd & Liberty Aves., Pittsburgh, Pa.
 Folsom Snow Guard Co., 80 Boylston St., Boston, Mass.
 Foote Foundry Co., J. B., N. Main St., Fredericktown, O.
 •Forst-Air Co., 840 Cedar St., Rockford, Ill.
 •Forest City Foundries Co., 2500 W. 27th St., Cleveland, O.
 Foss Heating & Engineering Co., 12 S. Chester Ave., Pasadena, Cal.
 Fox Engineering Co., 36 Portland St., Boston, Mass.
 •Fox Furnace Co., Elyria, O.
 Foxboro Co., Neponset Ave., Foxboro, Mass.
 Franklin Gas Appliance Co., 221-223 E. Eighth St., Cincinnati, O.

Fraser Furnace Co., Inc., 445 S. San Joaquin St., Stockton, Cal.
 Frederick Iron & Steel Co., E. 7th & East Sts., Frederick, Md.
 Free-Man Stoker & Engineering Co., 105 E. 63rd St., Chicago, Ill.
 French Rotary Oil Burner Co., P. O. Box 29, Sebastopol, Cal.
 Fresh'nd-Aire Co., 430 W. Erie St., Chicago, Ill.
 Frick Co., Inc., Waynesboro, Pa.
 Friedley-Voshardt Co., 761 Mather St., Chicago, Ill.
 •Friez & Sons, Inc., Julien P., 4 N. Central Ave., Baltimore, Md.
 Fuel Savers, Inc., 15th & Herr Sts., Harrisburg, Pa.
 Fuller-Warren Co., 2506 N. 32nd St., Milwaukee, Wis.
 Fulton-Sylphon Co., Knoxville, Tenn.
 •Furblo Co., 100 Main St., Hermansville, Mich.
 Furnaceslave, Inc., 1080 E. 52nd St., Indianapolis, Ind.

G

•G & O Mfg. Co., 138 Winchester Ave., New Haven, Conn.
 G. D. S. Shearing & Punching Machine Co., 101 Walker St., New York City.
 Galva Heater Co., Galva, Ill.
 Gammeter Co., W. F., Lincoln Ave. Extension, Cadiz, O.
 Garber Lumber & Construction Co., Strasburg, O.
 Garden City Fan Co., 332 S. Michigan Blvd., Chicago, Ill.
 Gardiner Metal Co., 2504 W. 48th Pl., Chicago, Ill.
 Gasweld & Airway, Inc., 625 W. Jackson Blvd., Chicago, Ill.
 Gates Rubber Co., 999 S. Broadway, Denver, Colo.
 Gehl Bros. Mfg. Co., West Bend, Wis.
 Gehri Co., 1117 Tacoma Ave., Tacoma, Wash.
 Gem City Stove Co., 508 Linden Ave., Dayton, O.
 General Air Conditioning Corp., 4411 Appleton St., Cincinnati, O.
 General Blower Co., 2402 Market St., Philadelphia, Pa.
 General Controls Co., 1370 Harrison St., San Francisco, Cal.; Broadway & E. 15th St., Cleveland, O.
 •General Electric Co., 1 River Rd., Schenectady, N. Y.
 General Equipment Co., 311-15-19 S. Wichita St., Wichita, Kan.
 General Insulating & Mfg. Co., 125 Fairview Ave., Alexandria, Ind.
 General Oil Heating Corp., 528 Jefferson St., West New York, N. J.
 General Refrigeration Sales Co., Shirland Ave., Beloit, Wis.
 General Regulator Corp., 2608 Arthington St., Chicago, Ill.
 General Sheet Metal Works, Inc., 120 Silliman Ave., Bridgeport, Conn.
 Gerhardt, W. F., 2007 W. Broad St., Richmond, Va.
 Germer Stove Co., Erie, Pa.
 Geuder, Paeschke & Frey Co., W. St. Paul Ave. and N. 15th St., Milwaukee, Wis.
 Giant Grip Mfg. Co., 31 Osceola St., Oshkosh, Wis.
 Gilbert & Barker Mfg. Co., Springfield, Mass.
 Gillian Mfg. Co., 7529 Puritan Ave., Detroit, Mich.
 Gilmer Co., L. H., Cottman & Keystone Sts., Tacony, Philadelphia, Pa.
 Glascock Bros. Mfg. Co., Muncie, Ind.
 •Gleason-Avery, Inc., 27 Clark St., Auburn, N. Y.
 Glidden Co., 11001 Madison Ave., Cleveland, O.
 Globe Iron Roofing & Corrugating Co., P. O. Box 734, Cincinnati, O.
 Globe Machine & Stamping Co., 1250 W. 76th St., Cleveland, O.
 Globe Machinery & Supply Co., 205-211 W. Court Ave., Des Moines, Ia.
 Globe Ventilator Co., 205 River St., Troy, N. Y.
 Goese Mfg. Co., 2548 N. 18th St., Milwaukee, Wis.
 Goethel Co., Alfred C., 2337 N. 31st St., Milwaukee, Wis.
 Goethel Sheet Metal Works, Alfred, 1912 N. Killian Pl., Milwaukee, Wis.
 Goldens' Foundry & Machine Co., Columbus, Ga.
 Gold Seal Furnace Co., 234 S. Fourth St., Minneapolis, Minn.
 Gold Star Oil Burner Mfg. Co., Inc., 146 Warburton Ave., Yonkers, N. Y.
 Goodrich Co., B. F., 516 S. Main St., Akron, O.
 Goodyear Tire & Rubber Co., E. Market St., Akron, O.
 Goulds Pumps, Inc., Fall St., Seneca Falls, N. Y.
 Graff Furnace Co., Scranton, Pa. (See Faultless Heater Corp., Cleveland, O.)
 Grand Rapids Blow Pipe and Dust Arrester Co., 525 Monroe Ave., Grand Rapids, Mich.
 Grand Rapids Die & Tool Co., 113-117 Michigan St., Grand Rapids, Mich.
 •Grand Rapids Furnace Cleaner Co., 1330 Phillips S. W., Cor. Stevens, Grand Rapids, Mich.
 Grand Rapids Wire Products Co., 503 Front Ave., N. W., Grand Rapids, Mich.
 Granite City Steel Co., 20th & Madison Ave., Granite City, Ill.
 Graton & Knight Co., 356 Franklin St., Worcester, Mass.
 Gray Metal Products, Inc., 20 Beacon St., Rochester, N. Y.
 Green Foundry & Furnace Works, Third & Elm Sts., Des Moines, Ia.
 Greene Tweed Co., 109 Duane St., New York City.
 Grinnell Co., Inc., 260 W. Exchange St., Providence, R. I.
 Grinnell Washing Machine Corp., 723-35 Main St., Grinnell, Ia.

- Griswold Mfg. Co., 1001-1065 W. 12th St., Erie, Pa.
- Grobet File Corp. of America, 3 Park Place, New York City.
- Guardian Electric Mfg. Co., 1621 W. Walnut St., Chicago, Ill.
- Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.

H

- Hague & Co., Inc., Alfred, 233 37th St., Brooklyn, N. Y.
- Hall Metal Products Co., 1285 Wilmington Blvd., Long Beach, Cal.
- Hall-Neal Furnace Co., 1324 N. Capitol Ave., Indianapolis, Ind.
- Halsted Iron Foundry, Halsted, Pa.
- Hamilton Automatic Stoker Corp., 1637 Dixie Highway, Hamilton, O.
- Hammett Mfg. Co., 1907 Holmes St., Kansas City, Mo.
- Hampden Cornice Works, 300 Birnie Ave., Springfield, Mass.
- Handelan Washed Air Co., 502 E. 24th St., Minneapolis, Minn.
- Handy & Harmon, 82 Fulton St., New York City.
- Hardinge Oil Burner Co., 1770 Berteau St. at Ravenswood, Chicago, Ill.
- Hardy Mfg. Co., 100 Davis Ave., Dayton, O.
- Hare Stoker Corp., 4853 Rivard St., Detroit, Mich.
- Harnischfeger Corp., 4400 W. National Ave., Milwaukee, Wis.
- Harold Furnace Mfg. Co., E., 3310 Sprague Ave., Spokane, Wash.
- Harrington & King Perforating Co., 5649 Fillmore St., Chicago, Ill.
- Harris Calorific Co., 5501 Cass Ave., N. W., Cleveland, O.
- Hart & Cooley Mfg. Co., 61 W. Kinzie St., Chicago, Ill.
- Hart & Crouse Co., Inc., 301 Turner St., Utica, N. Y.
- Hart Mfg. Co., Bartholomew & Hamilton Sts., Hartford, Conn.
- Hart Mfg. Co., 2006 N. Western Parkway, Louisville, Ky.
- Hart Oil Burner Corp., 2200 N. Adams St., Peoria, Ill.
- Hartzell Propeller Fan Co., 1025 Roosevelt Ave., Piqua, O.
- Harvey-Whipple, Inc., 55 Emery St., Springfield, Mass.
- Hassall, Inc., John, Clay & Oakland Sts., Brooklyn, N. Y.
- Hayes Custer Stove Co., 1202 N. Linden St., Bloomington, Ill.
- Haynes Furnace Fan Co., 614 Prospect St., Kansas City, Mo.
- Hays Corp., E. Eighth St., Michigan City, Ind.
- Hays Mfg. Co., 801 W. 12th St., Erie, Pa.
- H-B Instrument Co., Inc., 2518 N. Broad St., Philadelphia, Pa.
- Health Air Systems, Inc., 2941 E. Jefferson Ave., Detroit, Mich.
- Health-O-Mist Humidifier Mfg. Co., James St., Columbus, Wis.
- Heartley Machine & Tool Co., 900-8 Summit St., Toledo, O.
- Heat Control Corp., 3231 N. 30th St., Milwaukee, Wis.
- Heath & Milligan Mfg. Co., Div. of The Glidden Co., 1833 S. Normal Ave., Chicago, Ill.
- Heating Assurance, Inc., 124 E. Augusta, Spokane, Wash.
- Heckler Bros., 965 Liberty Ave., Pittsburgh, Pa.
- Hell Co., 3000 W. Montana St., Milwaukee, Wis.
- Hendley & Whittemore Co., 6 Blackhawk Blvd., Beloit, Wis.
- Hendrick Mfg. Co., 37 Dundaff St., Carbondale, Pa.
- Henry & Wright Mfg. Co., 760 Windsor St., Hartford, Conn.
- Henry Furnace & Foundry Co., 3473 E. 49th St., Cleveland, O.
- Her-Born Eng. & Mfg. Co., Box 666, Sandusky, O.
- Herrmann & Grace Co., 671 Bergen St., Brooklyn, N. Y.
- Herron-Zimmers Moulding Co., 3654 Beaufait, Detroit, Mich.
- Hess-Snyder Co., Massillon, O.
- Hess Warming & Ventilating Co., 1211 S. Western Ave., Chicago, Ill.
- Hetzel Roofing Products Co., 67 Main St., Newark, N. J.
- Higgin Mfg. Co., Newport, Ky.
- Hill Co., E. Vernon, 179 W. Washington St., Chicago, Ill.
- Hipoint Corp., Water, Elm & Arnold Sts., Bellefontaine, O.
- Hirschman Co., Inc., W. F., 220 Delaware Ave., Buffalo, N. Y.
- Hobart Brothers Co., Canal Lock Square, Troy, O.
- Hoersting & Holtmann Co., 1133 W. 3rd St., Dayton, O.
- Holcomb & Hoke Mfg. Co., 1545 Van Buren St., Indianapolis, Ind.
- Holland Furnace Co., Columbia Ave., Holland, Mich.
- Hollup Corp., 3357 W. 47th Pl., Chicago, Ill.
- Holtum Mfg. Co., Freeport, Ill.
- Holtzer-Cabot Electric Co., 125 Amory St., Boston, Mass.
- "Home Comfort" Furnace & Mfg. Co., 2901-11 Elliot Ave., St. Louis, Mo.
- Home Furnace Co., 6th St. & P. M. R.R., Holland, Mich.
- Home Oil Burner Corp., 236 Main St., Hempstead, N. Y.
- Home Stove Co., 501 Kentucky Ave., Indianapolis, Ind.
- Hones, Inc., Charles A., 122 S. Grand Ave., Baldwin, N. Y.
- Hood Co., B. Mifflin, Daisy, Tenn.
- Horn Co., A. C., 43-36 Tenth St., Long Island City, N. Y.
- Horton Mfg. Co., 3008 University Ave., S. E., Minneapolis, Minn.
- Hotentot Co., Inc., 1708 Howard St., Omaha, Nebr.
- Hotstream Heater Co., 8007 Grand Ave., Cleveland, O.
- Hough Co., Janesville, Wis.
- Houghton & Co., E. F., 240 W. Somerset St., Philadelphia, Pa.
- Howe & Bassett Co., Inc., 840 University Ave., Rochester, N. Y.
- Howell Electric Motors Co., Howell, Mich.
- Howell Mfg. Co., 1625 Cleveland Ave., Kansas City, Mo.
- Howes Co., S. M., 511 Medford St., Charlestown District, Boston, Mass.

- Hubbard Co., 1014 Marquette Ave., Minneapolis, Minn.
- Hudson Equipment Corp., 324 Third Ave., N., Minneapolis, Minn.
- Hugo Mfg. Co., 49th Ave. W. & Superior St., West Duluth, Minn.
- Humidi-Cooler Corp., New Haven, Conn.
- Humidity Headquarters, 1893 E. 55th St., Cleveland, O.
- Hum-O-Zone Co., Horicon, Wis.
- Hupp Oil Burner Co., Inc., 251 Prospect Ave., Brooklyn, N. Y.
- Hussey & Co., C. G., 2850 Second Ave., Pittsburgh, Pa.

I

- Ideal Commutator Dresser Co., 1084 Parks Ave., Sycamore, Ill.
- Ideal Electric & Mfg. Co., E. First & Oak Sts., Mansfield, O.
- Ideal Furnace Co., 2995 E. Grand Blvd., Detroit, Mich.
- Ideal Metal Weather Strip Co., 1015 Walnut, Box 461, Boulder, Colo.
- Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago, Ill.
- Illinois Iron & Bolt Co., 918 S. Michigan Ave., Chicago, Ill.
- Illinois Testing Laboratories, Inc., 412 N. LaSalle St., Chicago, Ill.
- Illinois Zinc Co., Peru, Ill.
- Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill.
- Imperial Electric Co., Ira Ave., Akron, O.
- Independence Stove & Furnace Co., Cor. Hayward & Cottage, Independence, Mo.
- Independent Air Filter Co., Inc., 215 W. Ohio St., Chicago, Ill.
- Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.
- Independent Register Co., 3741 E. 93rd St., Cleveland, O.
- Ingersoll-Rand, 11 Broadway, New York City.
- Ingersoll Steel & Disc Co., Division of Borg-Warner Corp., 310 S. Michigan Ave., Chicago, Ill.
- Ingle Mfg. Co., Atlantic & Grape Sts., San Diego, Cal.
- Inland Steel Co., 38 S. Dearborn St., Chicago, Ill.
- Insulite Co., 1100 Builders Exchange Bldg., Minneapolis, Minn.
- International Engineering, Inc., 1145 Bolander, Dayton, O.
- International Heater Co., 101 Park Ave., Utica, N. Y.
- International Nickel Co., Inc., 67 Wall St., New York City.
- International Steel Co., Edge St., Evansville, Ind.
- Interstate Machinery Co., Inc., 130 S. Clinton St., Chicago, Ill.
- Iona Ventilator Co., Inc., 2821-29 W. Dauphin St., Philadelphia, Pa.
- Iowa Foundry Co., W. 2nd & Cook, Sioux City, Ia.
- Iowa Paint Mfg. Co., 118-20 Eighth St., Des Moines, Ia.
- Iron Fireman Mfg. Co., 3170 W. 106th St., Cleveland, O.
- Iwan Brothers, 1503 Prairie Ave., South Bend, Ind.

J

- Jackson-Bangor Slate Co., Pen Argyl, Pa.
- Jackson Sheet Metal Works, 3012 Washington Ave., Ogden, Utah.
- Jacobs Co., B. & J., 1725 Johns St., Cincinnati, O.
- Jacobson Machine Works, Inc., A. E., 1090 Tenth Ave., S. E., Minneapolis, Minn.
- Jaden Mfg. Co., Inc., F., 1601 2nd St., Hastings, Nebr.
- Jamar Co., Walker, 367 S. First Ave., E., Duluth, Minn.
- Janette Mfg. Co., 556 W. Monroe St., Chicago, Ill.
- Jefferson Electric Co., 25th & Madison St., Bellwood, Ill.
- Jelliff Mfg. Corp., C. O., Southport, Conn.
- Jessop Steel Co., Washington, Pa.
- Jewett Stove & Foundry Corp., Military Rd., Buffalo, N. Y.
- Johns-Manville, 22 E. 40th St., New York City.
- Johnson Co., S. T., 940 Arlington St., Oakland, Cal.
- Johnson Fan & Blower Corp., 1319 W. Lake St., Chicago, Ill.
- Johnson Gas Appliance Co., 520 "E" Ave., N. W., Cedar Rapids, Ia.
- Johnson, Inc., William, Brenner & Kent Sts., Newark, N. J.
- Johnson Mfg. Co., Tenth & Sycamore, Waterloo, Ia.
- Johnson Mfg. Co., Urbana, O.
- Johnson Metal Products Co., Erie, Pa.
- Johnson Service Co., 507 E. Michigan St., Milwaukee, Wis.
- Johnson Tool Co., Inc., 65 Massasoit Ave., East Providence, R. I.
- Johnston & Chapman Co., 2925 Carroll Ave., Chicago, Ill.
- Johnston & Jennings Co., 877 Addison Rd., Cleveland, O.
- Johnston Co., Wm. W., 115 Bayard St., Dayton, O.
- Johnston Gas Furnace Corp., 5367 W. Washington St., Los Angeles, Cal.
- Johnston Mfg. Co., 2825 E. Hennepin Ave., Minneapolis, Minn.
- Johnston Tin Foil & Metal Co., 6106 S. Broadway, St. Louis, Mo.
- Joliet Heating Corp., 2101 Herkimer St., Joliet, Ill.
- Jones & Laughlin Steel Corp., Third Ave. & Ross St., Pittsburgh, Pa.
- Jones Foundry & Machine Co., W. A., 4401 W. Roosevelt Rd., Chicago, Ill.
- Jordan & Co., Paul R., 630 S. Delaware St., Indianapolis, Ind.

K

Kais Sunrise Works, 5659 Linwood Ave., Detroit, Mich.
 Kalamazoo Stove Co., Kalamazoo, Mich.
 Kane Mfg. Co., Kane, Pa.
 Kansas City Furnace Co., 624 Prospect, Kansas City, Mo.
 Kauffman Air Conditioning Corp., 4485 Olive St., St. Louis, Mo.
 Kaybar Burner Corp., 4545 Cottage Grove Ave., Chicago, Ill.
 Keasbey & Mattison Co., Butler Ave., Ambler, Pa.
 Keith Furnace Co., Dean Ave. at E. 26th, Des Moines, Ia.
 Kelsey Heating Co., 277 James St., Syracuse, N. Y.
 Kelvinator Corp., 14250 Plymouth Rd., Detroit, Mich.
 • Kent Co., Inc., 103 Canal St., Rome, N. Y.
 Kernchen Co., 103 E. Wacker Dr., Chicago, Ill.
 Kester Solder Co., 4201 Wrightwood Ave., Chicago, Ill.
 Ke-Ti Products Co., 1757 Franklin Ave., Columbus, O.
 Kewanee Boiler Corp., Kewanee, Ill.
 Kidder Mfg. Co., Inc., J. F., 426 Colchester Ave., Burlington, Vt.
 King Ventilating Co., Box 178, Owatonna, Minn.
 Kinnear Mfg. Co., P. O. Box 1407, Columbus, O.
 Kirk & Blum Mfg. Co., 2850 Spring Grove Ave., Cincinnati, O.
 Kisco Co., Inc., 4414-18 W. Papin St., St. Louis, Mo.
 Kitson Co., Westmoreland & Stokley Sts., Philadelphia, Pa.
 Klauer Mfg. Co., 9th & Washington Sts., Dubuque, Ia.
 Kleenaire Corp., 409 Jefferson St., Stevens Point, Wis.
 Kleen-Heat, Inc., 1823 Carroll Ave., Chicago, Ill.
 Klein Stove Co., Trenton Ave. & Tioga St., Philadelphia, Pa.
 Knowles Mushroom Ventilator Co., 41 N. Moore St., New York City.
 Kool-Kleen Air Conditioner Co., Sioux City, Ia.
 Koons Furnace Co., 219 W. Van Buren, Danville, Ill.
 Koppers Products Co., Koppers Bldg., Pittsburgh, Pa.
 Korfund Co., Inc., 48-15 32nd Pl., Long Island City, N. Y.
 Kraker, Henry, 54 W. 14th St., Holland, Mich.
 Kruse Co., Inc., 353 W. 16th Pl., Indianapolis, Ind.
 Kruse & Dewenter Co., 427-429 E. Washington St., Indianapolis, Ind.

L

• Laclede-Christy Clay Products Co., 411 N. Seventh St., St. Louis, Mo.
 Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
 Laco Oil Burner Co., 238 Union St., Griswold, Ia.
 La Crosse Steel Roofing & Corrugating Co., 300 S. Third St., La Crosse, Wis.
 Lamb & Ritchie Co., 250 Albany St., Cambridge, Mass.
 • Lamneck Products, Inc., 414 Dublin Ave., Columbus, O.
 Lastik Products Co., Inc., 807 American Bank Bldg., Pittsburgh, Pa.
 • Lau Blower Co., 954-72 E. Monument Ave., Dayton, O.
 Leach Co., 412 S. Main St., Oshkosh, Wis.
 Leahy Mfg. Co., 1804 E. 8th St., Los Angeles, Cal.
 Lecourtenay Co., 5 Main St., Newark, N. J.
 Ledkote Products Co., 35-29 23rd St., Long Island City, N. Y.
 Lee & Son Co., K. O., Aberdeen, S. D.
 Lee & Son Co., Thomas, 128-132 W. Second St., Cincinnati, O.
 Lee Heating Systems, 810 Union National Bank Bldg., Youngstown, O.
 Leeds & Northrup Co., 4953 Stenton Ave., Philadelphia, Pa.
 Leeson Co., T. F., 14631 Meyers Rd., Detroit, Mich.
 Leland Electric Co., 1501 Webster St., Dayton, O.
 Lennox Furnace Co., 200 Lincoln Highway, Marshalltown, Ia., and Syracuse, N. Y.
 Levow, David, 308 W. 20th St., New York City.
 Lewis Air Conditioners, Inc., 1600 Broadway, N. E., Minneapolis, Minn.
 Lewis & Co., Inc., Chas. S., 2207 Pine St., St. Louis, Mo.
 • Libert Machine Co., 324 N. Roosevelt St., Green Bay, Wis.
 Liberty Coal Burner Co., 4363 Duncan St., St. Louis, Mo.
 Liberty Foundry Co., 5001 S. 38th St., St. Louis, Mo.
 Lincoln Electric Co., 12818 Colt Rd., Cleveland, O.
 Linde Air Products Co., 30 E. 42nd St., New York City.
 Link-Belt Co., Stoker Div., 2410 W. 18th St., Chicago, Ill.
 Liquefied Gas Appliance Co., Mars, Pa.
 Lissberger & Son, Inc., Marks, 23-01 Borden Ave., Long Island City, N. Y.
 Little Burner Co., Inc., H. C., 2nd & Lincoln, San Rafael, Cal.
 Littleford Bros., 457 E. Pearl St., Cincinnati, O.
 • Lochinvar Corp., 11921 Grand River Ave., Detroit, Mich.
 Logan-Long Co., 37 W. Van Buren St., Chicago, Ill.
 Lookout Furnace Co., Manufacturer's Rd. & Compress St., Chattanooga, Tenn.
 Lord Mfg. Co., 1316 Holland St., Erie, Pa.
 Lovejoy Flexible Coupling Co., 5001 W. Lake St., Chicago, Ill.
 Ludlow-Saylor Wire Co., Newstead Ave. & Wabash R. R., St. Louis, Mo.
 Ludlum Steel Co., Watervliet, N. Y.
 Ludowici-Celadon Co., 104 S. Michigan Ave., Chicago, Ill.
 Lukens Metal Co., Thos. F., 1105 Fairmount Ave., Philadelphia, Pa.
 Lukens Steel Co., 104 S. First Ave., Coatesville, Pa.
 Lyman Co., H. B., Southampton, Mass.
 Lynn Products Co., 7 Willow St., Lynn, Mass.
 Lyon, Conklin & Co., Inc., Race & McComas Sts., Baltimore, Md.

M

McClave-Brooks Co., W. Poplar St., Scranton, Pa.
 McClure Builders' Supply Co., 68 E. Clark St., East Palestine, O.
 McCord Radiator & Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich.
 McCorkle Co., D. H., Sixth & Bancroft Way, Berkeley, Cal.
 McCormick & Co., J. H., Foot Susquehanna St., Williamsport, Pa.
 McDonnell & Miller, 400 N. Michigan Ave., Chicago, Ill.
 McGee-Parry Machine Works, 465 W. 8th S., Salt Lake City, Utah.
 McIlvaine Burner Corp., 663 W. Washington Blvd., Chicago, Ill.
 McPherson Furnace & Supply Co., 1805 N. E. 2nd Ave., Portland, Ore.
 McQuay, Inc., 1600 Broadway, N. E., Minneapolis, Minn.
 MaGill Foundry & Furnace Works, P. H., 401-413 E. Oakland Ave., Bloomington, Ill.
 Mahan Oil Burner & Furnace Co., Lake & Church, Elmhurst, Ill.
 Mahon Co., R. C., 8650 Mt. Elliott Ave., Detroit, Mich.
 Mahoning Valley Steel Co., McKees Lane, Niles, O.
 Mahr Mfg. Co., 1728 N. 2nd St., Minneapolis, Minn.
 • Mald-O'-Mist, Inc., 180 N. Wacker Dr., Chicago, Ill.
 Majestic Co., 733 Erie St., Huntington, Ind.
 Majestic Furnace Co., 1723 Westlake Ave., N., Seattle, Wash.
 Malleable Iron Fittings Co., Branford, Conn.
 Manhattan Perforated Metal Co., Inc., 43-17 37th St., Long Island City, N. Y.
 Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N. J.
 Maple City Furnace Co., 605 S. Main St., Monmouth, Ill.
 Maple Valley Mfg. Co., First St., Mapleton, Ia.
 • Maplewood Machinery Co., Inc., 2634 Fullerton Ave., and 561 W. Washington Blvd., Chicago, Ill.
 Marathon Electric Mfg. Corp., Wausau, Wis.
 Marlon Machine, Foundry & Supply Co., P. O. Box 685, Marion, Ind.
 Marley Co., 1915 Walnut St., Kansas City, Mo.
 Marlo Coil Co., 6135 Manchester Ave., St. Louis, Mo.
 Marsh Lumber Co., 535-611 Tuscarawas Ave., N. W., Dover, O.
 Marshall Furnace Co., Marshall, Mich.
 • Marshalltown Mfg. Co., 901 E. Nevada St., Marshalltown, Ia.
 Martin Bros., 52 Mt. Hope Ave., Rochester, N. Y.
 Martin Metal Mfg. Co., 900 E. 2nd St., Wichita, Kan.
 Martin-Parry Corp., W. Market St., York, Pa.
 Martocello & Co., Jos. A., 229 N. 13th St., Philadelphia, Pa.
 Masonite Corp., 111 W. Washington St., Chicago, Ill.
 Master Electric Co., 100 Davis Ave., Dayton, O.
 Master Welders, 2524 Holmes St., Kansas City, Mo.
 Matthlessen & Hegeler Zinc Co., Ninth St., LaSalle, Ill.
 Maurath, Inc., 7309 Union Ave., Cleveland, O.
 • Maurey Mfg. Corp., Wabash at 29th, Chicago, Ill.
 May-Pieberger Co., S. 21st St., Newark, O.
 Mayflower Oil Burner Corp., 5002 Hudson Blvd., West New York, N. J.
 May Oil Burner Corp., Maryland Ave. & Oliver St., Baltimore, Md.
 Maze Co., W. H., 1207 Water St., Peru, Ill.
 Mechanical Air, 801 Thomas St., Little Rock, Ark.
 Medart Co., 3500 DeKalb St., St. Louis, Mo.
 Meler Electric & Machine Co., 3525 E. Washington St., Indianapolis, Ind.
 Melbye Bros., Inc., 3204 N. Oakley Ave., Chicago, Ill.
 Mellish & Murray Co., 1715 Carroll Ave., Chicago, Ill.
 Merchant & Evans Co., 2035 Washington Ave., Philadelphia, Pa.
 • Merco Corp., 4201 Belmont Ave., Chicago, Ill.
 Merrill Co., Inc., 98 Granite St., Boston, Mass.
 Mesker & Co., Geo. L., 400 N. W. First St., Evansville, Ind.
 Metal Door & Trim Co., La Porte, Ind.
 Metal Products Co., 1811 Linn St., Cincinnati, O.
 Metalace Corp., 60 K St., South Boston, Mass.
 Metals Coating Co. of America, 495 N. Third St., Philadelphia, Pa.
 Metropolitan Refining Co., 23 50th Ave., Long Island City, N. Y.
 Metzner Stove Repair Co., 515 Wyandotte, Kansas City, Mo.
 • Meyer & Bro. Co., F., 1311-13 S. Adams St., Peoria, Ill.
 • Meyer Furnace Co., 1300 S. Washington St., Peoria, Ill.
 Meyers Fuel Saver Co., Inc., Janesville, Wis.
 Michigan Wire Cloth Co., 2100 Howard St., Detroit, Mich.
 Micro-Westco, Inc., Bettendorf, Ia.
 Midwest Aluminum Products, Inc., 123 E. Pittsburgh Ave., Milwaukee, Wis.
 Midwest Ventilating Works, 123 E. Pittsburgh Ave., Milwaukee, Wis.
 Milburn Co., Alexander, 1424 W. Baltimore St., Baltimore, Md.
 • Milcor Steel Co., 4117 W. Burnham St., Milwaukee, Wis.
 Miller & Connell Co., 1454-56 N. Claremont Ave., Chicago, Ill.
 Miller & Doig, Inc., 60 York St., Brooklyn, N. Y.
 Miller Conditionair, Inc., 1138 S. Broadway, Los Angeles, Cal.
 Miller Electric Mfg. Co., 905 N. Meade St., Appleton, Wis.
 Miller Equipment Co., 120 Opera Pl., Cincinnati, O.
 Miller Floor Furnace Co., 741 E. 14th St., Oakland, Cal.

- Miller Range & Furnace Co., Wm., 810-812 Main St., Cincinnati, O.
 Miller Rubber Co., Inc., 1247 S. High St., Akron, O.
 Mill-Rose Co., 2498 E. 79th St., Cleveland, O.
 Mills Novelty Co., 4110 W. Fullerton Ave., Chicago, Ill.
 Milwaukee Brush Mfg. Co., 2236 N. 30th St., Milwaukee, Wis.
 Milwaukee Welded Steel Corp., 3842 W. Burnham St., Milwaukee, Wis.
 Mineral Felt Co., 2284-92 Albion St., Toledo, O.
 Mineral Insulation Co., 103rd & S. West Highway, Chicago Ridge, Ill.
 Minneapolis Automatic Draft Regulator Co., 506 Produce Exchange Bldg., Minneapolis, Minn.
 ●Minneapolis-Honeywell Regulator Co., 2726 Fourth Ave., S., Minneapolis, Minn.
 Minn-Kota Foundry & Mfg. Co., 201 Second St., N., Fargo, N. D.
 Minster Machine Co., Minster, O.
 Mitchell Moulding Co., 1501 Circle Ave., Forest Park, Ill.
 Model Mfg. Co., 316 E. Main St., Richmond, Va.
 Modern Engineering Co., 3411 Pine Blvd., St. Louis, Mo.
 Modern Heat Regulator Co., E. 55th St., at Utica Ave., Cleveland, O.
 Modine Mfg. Co., 17th St., Racine, Wis.
 Moeller Instrument Co., 132nd St. & 89th Ave., Richmond Hill, N. Y.
 Mohler Co., J. K., 151 Church Ave., Ephrata, Pa.
 Mohr-Air Co., 422 Huber Bldg., Marion, O.
 Moloch Foundry & Machine Co., Kaukauna, Wis.
 Monarch Mfg. Works, Inc., Salmon & Westmoreland Sts., Philadelphia, Pa.
 Monarch Metal Weatherstrip Corp., 6333 Etzel Ave., St. Louis, Mo.
 Moncrief Furnace Co., P. O. Box 1673, Atlanta, Ga.
 ●Monmouth Products Co., 231 E. 131st St., Cleveland, O.
 Montag Stove & Furnace Works, 2011 N. Columbia Blvd., Portland, Ore.
 Montgomery Bros., 61 Fremont St., San Francisco, Cal.
 Moore Corp., Benton St., Joliet, Ill.
 Morris Machine Works, 20 E. Genesee St., Baldwinsville, N. Y.
 Morrissey & Co., 325 W. Huron St., Chicago, Ill.
 Morse Chain Co., Turner Pl., Ithaca, N. Y.
 Mortell Co., J. W., 310 S. Michigan Ave., Chicago, Ill.
 Motorstokor Div., Hershey Machine & Foundry Co., Mannheim, Pa.
 Motor Wheel Corp., Heater Division, E. May St., Lansing, Mich.
 ●Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
 ●Mueller Furnace Co., L. J., 2005 W. Oklahoma Ave., Milwaukee, Wis.
 Mullins Mfg. Corp., 1021 Mill St., Salem, O.
 Muncie Gear Works, Inc., N. Vine St., Muncie, Ind.
 Mundet Cork Corp., 450 7th Ave., New York City.
 Mundt & Sons, Charles, 53 Fairmount Ave., Jersey City, N. J.
 Murray Tile Co., Cloverport, Ky.
 Myers & Bro. Co., The F. E., Ashland, O.
 Myers Electric Co., 424 Fourth Ave., Pittsburgh, Pa.

N

- Nash Engineering Co., South Norwalk, Conn.
 Nash Refrigeration Co., Inc., Summit, New & Bleecker Sts., Newark, N. J.
 National Airoil Burner Co., 1327 Girard Ave., Philadelphia, Pa.
 National Brass & Copper Co., Inc., 518 Grant Bldg., Pittsburgh, Pa.
 ●National Fan & Blower Corp., 541 W. Washington Blvd., Chicago, Ill.
 National Fireproofing Corp., Fulton Bldg., Pittsburgh, Pa.
 ●National Foundry & Furnace Co., Station "B," Dayton, O.
 National Gypsum Co., Delaware Ave., Buffalo, N. Y.
 National Lead Co., 111 Broadway, New York City.
 National Machine Tool Co., 1536 Clark St., Racine, Wis.
 National Machine Works, 122 S. Michigan Ave., Chicago, Ill.
 National Mfg. Corp., 153 Fillmore Ave., Tonawanda, N. Y.
 National Regulator Co., 2301 N. Knox Ave., Chicago, Ill.
 National Screw & Mfg. Co., 2440 E. 75th St., Cleveland, O.
 National Sheet Metal Co., 1617-1629 Water St., Peru, Ill.
 National Steam Pump Co., 701 W. Johnson St., Upper Sandusky, O.
 National Super Service Co., 1944 N. 13th St., Toledo, O.
 Neemes Foundry, Inc., 286 First St., Troy, N. Y.
 Nelson Co., 2604 4th Ave., Detroit, Mich.
 Nelson Corp., Herman, 1824 Third Ave., Moline, Ill.
 Nesbitt, Inc., John J., State Rd. & Rhawn St., Philadelphia, Pa.
 New Albany Machine Mfg. Co., E. 10th & Water Sts., New Albany, Ind.
 New Delphos Mfg. Co., 102-124 S. Pierce St., Delphos, O.
 New Departure Mfg. Co., Bristol, Conn.
 New Haven Copper Co., Seymour, Conn.
 New Jersey Zinc Sales Co., 160 Front St., New York City.
 Newman Brothers, Inc., 662-670 W. Fourth St., Cincinnati, O.
 Newport Rolling Mill Co., The, 9th & Lowell Sts., Newport, Ky.
 New York Blower Co., 3155 Shields Ave., Chicago, Ill.
- Niagara Blower Co., 6 E. 45th St., New York City.
 ●Niagara Machine & Tool Works, 637-697 Northland Ave., Buffalo, N. Y.
 Niles Rolling Mill Co., Niles, O.
 Nomis Corp., 410-420 Lingle Ave., Lafayette, Ind.
 Norge Heating & Conditioning Div., Borg-Warner Corp., 670 E. Woodbridge St., Detroit, Mich.
 Norma-Hoffman Bearings Corp., Stamford, Conn.
 Norman Sheet Metal Mfg. Co., W. F., 212-236 N. Cedar St., Nevada, Mo.
 Norristown Magnesia & Asbestos Co., Washington St., Below Ford St., Norristown, Pa.
 North Bangor Slate Co., Bangor, Pa.
 Northern Weatherstrip Co., 367 S. 1st Ave. E., Duluth, Minn.
 ●Northwestern Stove Repair Co., 662 W. Roosevelt Rd., Chicago, Ill.
 Nortmann-Duffke Co., 2740 S. 32nd St., Milwaukee, Wis.
 Novy Ventilator Mfg. Co., 207 E. Broadway, Muskogee, Okla.
 Nugent Sons, Inc., Thos., 223 E. 80th St., New York City.
 ●Nu-Way Corp., 2416 Fourth Ave., Rock Island, Ill.

O

- Oakland Foundry Co., Avenue A & L. & N. Tracks, Belleville, Ill.
 ●Ohio Electric Mfg. Co., 5910 Maurice Ave., Cleveland, O.
 Ohio Pattern Wks. & Fdry. Co., 2730 Spring Grove Ave., Cincinnati, O.
 ●Ohio Products Co., 17606 Milburn Ave., Cleveland, O.
 Ohio Valley Pulley Works, Maysville, Ky.
 Ohio Welder Co., Middlefield, O.
 Ohio Wire Products Co., Public Square, Dover, O.
 Ohl & Co., Geo. A., 151-161 Oraton St., Newark, N. J.
 Ohmlac Paint & Refining Co., 6540 S. Central Ave., Chicago, Ill.
 ●Oil Burner Builders, Inc., Bellevue, Ia.
 Orbon Stove Co., L. & N. and Sycamore St., Belleville, Ill.
 Ormsby-Gray Combustion Service, Inc., 6625 Delmar Blvd., St. Louis, Mo.
 ●Osborn Co., J. M. & L. A., 1541 E. 38th St., Cleveland, O.
 Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
 Otis Steel Co., 3341 Jennings Rd., Cleveland, O.
 OverSpreed Stoker Co., Fulton, Jackson & Jefferson Sts., Ottawa, Ill.
 Owen-Dyneto Corp., Syracuse, N. Y.
 ●Owens-Illinois Glass Co., Ohio Bldg., Toledo, O.

P

- Pacific Gas Radiator Co., 1740 W. Washington St., Los Angeles, Cal.
 Pacific Lumber Co., 102 Bush St., San Francisco, Cal.
 Pacific States Felt & Mfg. Co., Inc., 845 Howard St., San Francisco, Cal.
 Packham Crimper Co., Mechanicsburg, O.
 Page Steel & Wire Div. of American Chain Co., Inc., Monessen, Pa.
 Palmer Electric Co., 1258 Park Pl., Detroit, Mich.
 "Pamco" Conditional Co., 4223 W. Lake St., Chicago, Ill.
 Pan American Engineering Corp., Ltd., 820 Parker St., Berkeley, Cal.
 Paragon Electric Co., 37 W. Van Buren St., Chicago, Ill.
 Paragon Kol-Master Corp., Oregon, Ill.
 Park City Cornice Works, Inc., 56 McKinley Ave., Bridgeport, Conn.
 ●Parker-Kalon Corp., 190 Varick St., New York City.
 Parkersburg Iron & Steel Co., Parkersburg, W. Va.
 Parks-Cramer Co., 970 Main St., Fitchburg, Mass.
 Patten Co., J. V., 500 DeKalb Ave., Sycamore, Ill.
 Patterson Foundry & Machine Co., East Liverpool, O.
 Patterson Shade Co., 1525 N. Meridian St., Indianapolis, Ind.
 ●Payne Furnace & Supply Co., 338 N. Foothill Rd., Beverly Hills, Cal.
 ●Peck, Stow & Wilcox Co., Center St., Southington, Conn.
 Pecora Paint Co., 4th St. & Erie Ave., Philadelphia, Pa.
 ●Peerless Electric Co., W. Market, Warren, O.
 ●Peerless Foundry Co., 1853 Ludlow Ave., Indianapolis, Ind.
 Peerless Ice Machine Co., 515 W. 35th St., Chicago, Ill.
 Peerless Oil Burner Co., Inc., 3926 Main St., Kansas City, Mo.
 Pels & Co., Inc., Henry, 90 West St., New York City.
 Pencilsharp Awl & Tool Co., 1423-25 E. Illinois St., Evansville, Ind.
 ●Peninsular Stove Co., 2699 Gratiot Ave., Detroit, Mich.
 ●Penn Electric Switch Co., E. 20th & Walnut, Des Moines, Ia.
 Pennsylvania Engineering Works, 526 S. Jefferson St., New Castle, Pa.
 Pennsylvania Furnace & Iron Co., Pine St., Warren, Pa.
 Penn Ventilating Co., 2812 Richmond St., Philadelphia, Pa.
 Pentecost & Craft Co., 429 Wabash Ave., Terre Haute, Ind.
 Peoples Oil Burner Co., 466 W. Superior St., Chicago, Ill.
 Perfect Burner Co., 294 Broad St., Lynn, Mass.
 Perfectaire Corp., 1102 N. Charles St., Baltimore, Md.
 Perfection Grate & Stoker Co., 4 Fisk Ave., Springfield, Mass.
 Perfection Stove Co., 7609 Platt Ave., Cleveland, O.
 ●Perfex Controls Co., 415 W. Oklahoma Pl., Milwaukee, Wis.

- Perkins & Son, Inc., B. F., Chicopee & Montgomery Sts., Holyoke, Mass.
 Perkins Machine Co., 4 Perkins Ave., Warren, Mass.
 Perkinson & Brown, 412 N. Lincoln St., Chicago, Ill.
 Perrin Co., Edward C., 3rd & Grant Sts., Camden, N. J.
 Peterson Freezem Mfg. Co., 109 W. 18th St., Kansas City, Mo.
 Petroleum Heat & Power Co., 110 Davenport St., Stamford, Conn.
 Pfanstiehl Chemical Co., 104 Lakeview Ave., Waukegan, Ill.
 Phillips Heating, Ventilating & Mfg. Co., 1710 W. Washington St., Los Angeles, Cal.
 Platt Products Corp., 1149 S. Pennsylvania Ave., Lansing, Mich.
 Pier Equipment Mfg. Co., 1440 Milton St., Benton Harbor, Mich.
 Pilley Packing and Flue Brush Mfg. Co., 606 S. 3rd St., St. Louis, Mo.
 Pioneer Heat Regulator Corp., 100 Davis Ave., Dayton, O.
 Pioneer Oil Burner Co., 714 Oakland N. E., Cedar Rapids, Ia.
 Pittsburgh Equitable Meter Co., 400 N. Lexington Ave., Pittsburgh, Pa.
 Pittston Stove Co., P. O. Box 29, Pittston, Pa.
 Plastic Products Co., 6475 Georgia Ave., Detroit, Mich.
 Plibrico Jointless Firebrick Co., 1800 Kingsbury St., Chicago, Ill.
 Plymouth Cordage Co., Court St., North Plymouth, Mass.
 Plymouth Industries, Inc., 1932 Harrison Ave., Plymouth, Ind.
 ●Poe, Ralph W., 44 White Ct., Canton, Ill.
 Polk Mfg. Co., 2021-23 Winnebago St., Madison, Wis.
 Pomona Pump Co., 206 E. Commercial St., Pomona, Cal.
 Portland Stove Fdry Co., Portland, Me.
 Potomac Mfg. Co., 316 S. 10th St., Philadelphia, Pa.
 Power King Tool Corp., 310 E. Market St., Warsaw, Ind.
 Powers Regulator Co., 2720 Greenview Ave., Chicago, Ill.
 ●Practical Instrument Co., 2713 N. Ashland Ave., Chicago, Ill.
 Precision Thermometer & Instrument Co., 1434 Brandywine St., Philadelphia, Pa.
 ●Premier Division, Electric Vacuum Cleaner Co., Inc., 1734 Ivanhoe Rd., Cleveland, O.
 ●Premier Furnace Co., Box 150, Dowagiac, Mich.
 Pressite Engineering Co., 3900 Chouto St., St. Louis, Mo.
 Pressure Oil Burners, Inc., 55 N. Broad St., York, Pa.
 Propellair, Inc., 1345 Lagonda Ave., Springfield, O.
 Providence Cornice Co., 309 Canal St., Providence, R. I.
 Pryne & Co., Inc., 1245 E. 33rd St., Los Angeles, Cal.
 Puhl & Hepper Mfg. Co., Inc., 6400 W. Florissant Ave., St. Louis, Mo.
 Pyott Foundry & Machine Co., 328 N. Sangamon St., Chicago, Ill.
 ●Pyrolite Products Co., 1221-31 W. 74th St., Cleveland, O.

Q

- Quaker Mfg. Co., 223 W. Erie St., Chicago, Ill.
 Quickwork Co., 900 N. Spaulding Ave., Chicago, Ill.
 Quimby Pump Co., Inc., 340 Thomas St., Newark, N. J.

R

- R-S Products Corp., 4530 Germantown Ave., Philadelphia, Pa.
 Racine Sheet Metal Works, Olive & Lathrop Sts., Racine, Wis.
 Racine Stoker Mfg. Co., 1014 Eighth St., Racine, Wis.
 Rafter Machine Co., 259 Stephen St., Belleville, N. J.
 Ramey Mfg. Co., 243 N. 5th St., Columbus, O.
 Ramtite Co., Division of S. Obermayer Co., 2563 W. 18th St., Chicago, Ill.
 ●Randall Graphite Products Corp., 609 W. Lake St., Chicago, Ill.
 Ravenna Furnace & Heating Co., Ravenna, O.
 Ray Oil Burner Co., 401-499 Bernal Ave., San Francisco, Cal.
 Reading Iron Co., 401 N. Broad St., Philadelphia, Pa.
 Red Jacket Mfg. Co., Davenport, Ia.
 Redl Automatic Coal Burners, Inc., N. 107 Freya St., Spokane, Wash.
 Reed Unit-Fans, Inc., 730-34 St. Charles St., New Orleans, La.
 Reeves Mfg. Co., Dover, O.
 Refrigeration Appliances, Inc., 1342 W. Lake St., Chicago, Ill.
 Rega Mfg. Co., 79 Mt. Hope Ave., Rochester, N. Y.
 Regal Metal Products Co., 111 W. Washington St., Chicago, Ill.
 ●Register & Grille Mfg. Co., Inc., 70 Berry St., Brooklyn, N. Y.
 Reichert Float & Mfg. Co., 2238 Smead Ave., Toledo, O.
 Reif-Rexoil, Inc., 37 Carroll St., Buffalo, N. Y.
 Reilly Tar & Chemical Co., 1615 Merchants Bank Bldg., Indianapolis, Ind.
 Reliance Electric & Engineering Co., 1088 Ivanhoe Rd., Cleveland, O.
 Reliance Refrigeration Machine Co., 3401 N. Kedzie Ave., Chicago, Ill.
 Rempe Coil Co., 340 N. Sacramento Ave., Chicago, Ill.
 ●Republic Steel Corp., Republic Bldg., Cleveland, O.

- Research Corp., 405 Lexington Ave., New York City.
 ●Revere Copper & Brass, Inc., 230 Park Ave., New York City.
 Reynolds Corp., 19 Rector St., New York City.
 Reznor Mfg. Co., Mercer, Pa.
 Rhoads & Sons, J. E., 11th & B. & O. R. R., Wilmington, Del.
 Rhodes, Inc., M. H., Rockefeller Center, New York City.
 Ribside Furnace Co., 119½ Clinton St., Wausau, Wis.
 Richards-Wilcox Mfg. Co., Third St., Aurora, Ill.
 Richardson & Boynton Co., 244 Madison Ave., New York City.
 Richmond Fireproof Door Co., Richmond, Ind.
 Ripley Co., W. R., 318 N. "E" St., Tacoma, Wash.
 Risdon Stoker Corp., 6355 Rainier Ave., Seattle, Wash.
 Rising & Nelson Slate Co., West Pawlet, Vt.
 Roan Mfg. Co., 1220 Washington Ave., Racine, Wis.
 Robbins & Myers, Inc., 1345 Lagonda Ave., Springfield, O.
 Roberts-Gordon Appliance Corp., 137 Arthur St., Buffalo, N. Y.
 Roberts-Hamilton Co., 707-715 S. Third St., Minneapolis, Minn.
 Robertsonshaw Thermostat Co., Youngwood, Pa.
 Robertson Co., H. H., Grant Bldg., Pittsburgh, Pa.
 Robeson Engineering Co., 290 Sanford St., East Orange, N. J.
 Robinson Furnace Co., 213 W. Austin Ave., Chicago, Ill.
 Robinson Heating & Ventilating Corp., 632-646 Erie St., S. Massillon, O.
 Rochester Lead Works, Inc., 380 Exchange St., Rochester, N. Y.
 Rochester Mfg. Co., Inc., Rockwood St., Rochester, N. Y.
 ●Rock Island Register Co., 2435 Fifth Ave., Rock Island, Ill.
 Rock Island Stove Co., 200 Fourth St., Rock Island, Ill.
 Rock River Machine Co., Inc., N. Main St., Janesville, Wis.
 Rockwood Mfg. Co., 1801 English Ave., Indianapolis, Ind.
 Rock Wool Products Co., Inc., P. O. Box 276, Wabash, Ind.
 Roebbing's Sons Co., John A., 640 S. Broad St., Trenton, N. J.
 Roller Bearing Co. of America, Whitehead Rd., Trenton, N. J.
 Rome-Turney Radiator Co., Canal St., Rome, N. Y.
 Root-Connersville Blower Corp., Connersville, Ind.
 Roper Corp., Geo. D. Blackhawk Ave., Rockford, Ill.
 Rosebraugh Co., W. W., 680 S. 17th St., Salem, Ore.
 Rosedale Foundry & Machine Co., Columbus Ave., N. S., Pittsburgh, Pa.
 Rotary Mfg. Co., 5718 Long Beach Ave., Los Angeles, Cal.
 Round Oak Co., Dowagiac, Mich.
 Roxalin Flexible Lacquer Co., 800 Magnolia Ave., Elizabeth, N. J.
 Royal Metal Products Co., 58 Schenectady Ave., Brooklyn, N. Y.
 Royal Ventilator Co., 415 Locust St., Philadelphia, Pa.
 Ruberoid Co., 500 Fifth Ave., New York City.
 ●Ruby Chemical Co., 66 McDowell St., Columbus, O.
 ●Rudy Furnace Co., Dowagiac, Mich.
 Rupp Forge & Shear Co., 10312 Meech Ave., Cleveland, O.
 ●Russell Electric Co., 342 W. Huron St., Chicago, Ill.
 Russell Mfg. Co., John M., Naugatuck, Conn.
 Rutland Fire Clay Co., Curtis Ave., Rutland, Vt.
 ●Rybolt Heater Co., Miller St., Ashland, O.
 ●Ryerson & Son, Inc., Joseph T., 2558 W. 16th St., Chicago, Ill.
 Ryniker Sheet Metal Works, Inc., 122-124 N. 25th St., Billings, Mont.

S

- S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
 Safe Automatic Heat Control Co., 16512 Wark Ave., Detroit, Mich.
 Saino Mfg. Co., Inc., F. L., 70 W. Colorado Ave., Memphis, Tenn.
 St. Clair Foundry Corp., Beech & Wilson Sts., Centralia, Ill.
 St. Paul Corrugating Co., Wabash & Water Sts., St. Paul, Minn.
 Sall Mountain Co., 176 W. Adams St., Chicago, Ill.
 Sallada Mfg. Co., 3816 Grand Ave., S., Minneapolis, Minn.
 Sampson Stoker Corp., Mendota, Ill.
 Sangamo Electric Co., 1301 N. 11th St., Springfield, Ill.
 Sauereisen Cements Co., 2308 Main St., Sharpsburg Station, Pittsburgh, Pa.
 Savage Arms Corp., 100 E. 42nd St., New York City.
 Savage Co., W. J., 912 W. Clinch Ave., Knoxville, Tenn.
 ●Schaefer Brush Mfg. Co., 1009 S. 2nd St., Milwaukee, Wis.
 Schatz Mfg. Co., Fairview, Poughkeepsie, N. Y.
 Schatz Venetian Blinds, Los Angeles, Cal.
 Schill Mfg. Co., Mansfield St., Crestline, O.
 Schoedinger Co., F. O., 322-358 Mt. Vernon Ave., Columbus, O.
 ●Schwab Furnace & Mfg. Co., 123 Gilt Edge Ave., Cedar Grove, Wis.
 ●Schwitzer-Cummins Co., Fan St., Indianapolis, Ind.
 ●Scott-Newcomb, Inc., 1929 Pine St., St. Louis, Mo.
 Scovill Mfg. Co., Morency-Van Buren Div., Prairie Ave., Sturgis, Mich.
 Security Stove & Mfg. Co., 1630 Oakland, Kansas City, Mo.
 Sentry Mfg. Co., 505 Baum Bldg., Omaha, Nebr.
 Servel, Inc., 119 Morton Ave., Evansville, Ind.
 Service Machine Co., 750-760 Broadway, Elizabeth, N. J.
 Sharon Steel Corp., Sharon, Pa.

- Shedlov Oil Burners, Inc., 717 Third Ave., S., Minneapolis, Minn.
- Sheer Co., H. M., 2nd & Hampshire Sts., Quincy, Ill.
- Sheet Metal Products Co., 320 S. Commercial St., Peoria, Ill.
- Sheldon Slate Co., F. C., Granville, N. Y.
- Sight Feed Generator Co., 14 N. Tenth St., Richmond, Ind.
- Signal Electric Mfg. Co., Menominee, Mich.
- Silent Glow Oil Burner Corp., 1477 Park St., Hartford, Conn.
- Silent Sioux Oil Burner Corp., Orange City, Ia.
- Simplex Oil Heating Corp., 30 Church St., New York City.
- Sinker-Davis Co., 230 S. Missouri St., Indianapolis, Ind.
- Skilbeck Mfg. Co., 6721 26th Ave., Kenosha, Wis.
- Skillsaw, Inc., 3302 Elston Ave., Chicago, Ill.
- Skinner Co., E. W., 402 Pearl St., Fitchburg, Mass.
- Skuttle Co., J. L., 4290 W. Fort St., Detroit, Mich.
- Sly Mfg. Co., W. W., 4700 Train Ave., Cleveland, O.
- Smith & Kanzler, Inc., 516 Lidgerwood Ave., Elizabeth, N. J.
- Smith, Inc., Winfield H., Eaton St., Springfield, N. Y.
- Smith Welding Equipment Corp., 2619-33 Fourth St., S. E., Minneapolis, Minn.
- Smuck-Thiele Co., 410 W. Tenth St., Indianapolis, Ind.
- Somers, Inc., H. J., 6063 Wabash Ave., Detroit, Mich.
- Sonner Burner Co., 6th & Andrews, Winfield, Kan.
- Southbridge Roofing Co., Inc., Hartwell & Chapin Sts., Southbridge, Mass.
- Southern States Iron Roofing Co., Stiles Ave., Savannah, Ga.
- Spear Stove & Heating Co., James, 1823 Market St., Philadelphia, Pa.
- Speedway Mfg. Co., 1854 S. 52nd Ave., Cicero, Ill.
- Spencer Air Conditioning Service, 1237 Acoma St., Denver, Colo.
- Spencer Thermostat Co., 34 Forest St., Attleboro, Mass.
- Spencer Turbine Co., 484 New Park Ave., Hartford, Conn.
- Sprayo-Flake Co., 2715 Irving Park Blvd., Chicago, Ill.
- Spray-Wheel Air Conditioners, Inc., 1320 19th St., Denver, Colo.
- Springman Metal Specialty Co., 424 Bellevue Ave., Detroit, Mich.
- Spun Steel Corp., 2037 Dueber Ave., S. W., Canton, O.
- Square D Co., 6060 Rivard St., Detroit, Mich.
- Standard Air Conditioning, Inc., 40 W. 40th St., New York City.
- Standard Asbestos Mfg. Co., 820-22 W. Lake St., Chicago, Ill.
- Standard Engineering Works, 289 Roosevelt Ave., Pawtucket, R. I.
- Standard Foundry & Furnace Co., 1801 Pleasant St., De Kalb, Ill.
- Standard Fuel Engineering Co., 667 Post Ave., South, Detroit, Mich.
- Standard Furnace & Supply Co., 407-13 S. 10th St., Omaha, Nebr.
- Standard Heating & Radiator Co., 220 Penn Ave., Pittsburgh, Pa.
- Standard Lime & Stone Co., 2004 First National Bank Bldg., Baltimore, Md.
- Standard Rolling Mills, Inc., 143 Jewell St., Brooklyn, N. Y.
- Standard Stamping & Perforating Co., 3131 W. 49th Pl., Chicago, Ill.
- Standard Ventilator Co., Lewisburg, Pa.
- Stanley Electric Tool Div., The Stanley Works, Elm St., New Britain, Conn.
- Stanley Rule & Level Plant, New Britain, Conn.
- Stanton Heater Co., Martins Ferry, O.
- Star Electric Motor Co., 197 Grove St., Bloomfield, N. J.
- Star Radiator Co., 649 Ceres Ave., Los Angeles, Cal.
- Staynew Filter Corp., 25 Leighton Ave., Rochester, N. Y.
- Steel and Tubes, Inc., 224 E. 131st St., Cleveland, O.
- Steel Products Engineering Co., Columbia St. at Dakota Ave., Springfield, O.
- Steelweld Machinery Co., E. 70th & Machinery Ave., Cleveland, O.
- Steen-Dyer Mfg. Co., 5204 E. 15th St., Kansas City, Mo.
- Sterling Foundry Co., Sterling, Ill.
- Ster-Na-Man Fdry Co., 441 Williams St., Springfield, Ill.
- Stewart Foundry, O. S., 887 E. 67th St., Cleveland, O.
- Stiglitz Furnace & Foundry Co., 2007-23 Portland Ave., Louisville, Ky.
- Stilphen Engineering & Mfg. Co., C. A., 1129 Eighteenth St., Denver, Colo.
- Sto-Coke Incorporated, 1511 E. Michigan, Indianapolis, Ind.
- Stok-A-Fire Co., 900 S. 23rd St., St. Louis, Mo.
- Stokermatic Co., 1415 S. State St., Salt Lake City, Utah.
- Stoker Products, Inc., 221 W. Prairie Ave., Decatur, Ill.
- Stokers, Inc., 10821 E. Jefferson Ave., Detroit, Mich.
- Stover Mfg. & Engine Co., N. Henderson Ave., Freeport, Ill.
- Stran-Steel Corp., 6100 McGraw Ave., Detroit, Mich.
- Stratton & Terstegge Co., 15th & Main St., Louisville, Ky.
- Streamline Pipe & Fittings Div., Mueller Brass Co., Port Huron, Mich.
- Structural Slate Co., Robinson Ave., Pen Argyl, Pa.
- Sturtevant Co., B. F., Damon St., Hyde Park, Boston, Mass.
- Summerheat Co., 406 S. Columbia, South Bend, Ind.
- Sundstrand Sales Co., 2592 Ninth St., Rockford, Ill.
- Sun-Ray Oil Burner Corp., 114-02 Beach Channel Dr., Rockaway Park, N. Y.
- Superior Sheet Steel Co., The Division of Continental Steel Corp., Canton & Louisville Rd., Canton, O.
- Superior Steel Corp., Grant Bldg., Pittsburgh, Pa.
- Superstat Co., 38 Walter St., Springfield, Mass.
- Supreme Electric Products Corp., 103 Mt. Hope Ave., Rochester, N. Y.
- Surface Combustion Corp., 2375 Dorr St., Toledo, O.
- Swaby Mfg. Co., 2010-2014 Marshall Blvd., Chicago, Ill.
- Swaine Mfg. Co., Fred J., 1300 N. Seventh St., St. Louis, Mo.
- Swartwout Co., 18615 Euclid Ave., Cleveland, O.
- Swedish Venetian Blind Co., 601 W. 26th St., New York City.
- Swift Corp., Carl E., North Side, Holland, Mich.
- Syncro-Flame Burner Corp., 1200 Park St., Hartford, Conn.
- Syncromatic Air Conditioning Corp., 3373 N. Holton St., Milwaukee, Wis.
- Syracuse Fire Door Corp., 900 Canal St., Syracuse, N. Y.

T

- Taber Pump Co., 291 Elm St., Buffalo, N. Y.
- Taco Heaters, Inc., 342 Madison Ave., New York City.
- Tagliabue Mfg. Co., C. J., Park & Nostrand Aves., Brooklyn, N. Y.
- Tamms Silica Co., 228 N. La Salle St., Chicago, Ill.
- Tannewitz Works, 315 Front Ave., N. W., Grand Rapids, Mich.
- Tatro Brothers, Inc., 218 Washington St., Decorah, Ia.
- Taylor Co., N. & G., Div. Republic Steel Co., Cumberland, Md.
- Taylor-Hall Welding Corp., 99 Hope Ave., Worcester, Mass.
- Taylor Instrument Companies, 95 Ames St., Rochester, N. Y.
- Taylor-Winfield Corp., 1052 Mahoning Ave., N. W., Warren, O.
- Technical Coatings, Inc., 9-15 Park Place, New York City.
- Teesdale Mfg. Co., 427 Market St., Grand Rapids, Mich.
- Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.
- Texo Sales & Mfg. Co., 47 Walnut St., Cincinnati, O.
- Thatcher Co., 39 St. Francis St., Newark, N. J.
- Thermal Units Mfg. Co., 64 E. 25th St., Chicago, Ill.
- Thermax Division, Northwest Magnesite Co., Farmers Bank Bldg., Pittsburgh, Pa.
- Therminsul Corp., 1603 Fulford St., Kalamazoo, Mich.
- Thermoid Rubber Co., Whitehead Rd., Trenton, N. J.
- Thompson & Co., Box 6757, Pittsburgh, Pa.
- Thompson Mfg. Co., 30th & Larimer Sts., Denver, Colo.
- Thomson-Gibb Electric Welding Co., 161 Pleasant St., Lynn, Mass.
- Tidewater Engineering Co., Gloucester, Mass.
- Tierney Rotor Ventilator Co., 239 4th Ave., S., Minneapolis, Minn.
- Tiffin Art Metal Co., Broad & Second Ave., Tiffin, O.
- Tillery's Little Janitor Clock Co., 55-57 Orchard St., Newark, N. J.
- Timken Silent Automatic Div., Timken-Detroit Axle Co., 100 Clark Ave., Detroit, Mich.
- Todd Combustion Equipment, Inc., Ft. of 23rd St., Brooklyn, N. Y.
- Torchweld Equipment Co., 1035 W. Lake St., Chicago, Ill.
- Tork Clock Co., Inc., 31 South St., Mt. Vernon, N. Y.
- Torrington Mfg. Co., 70 Franklin St., Torrington, Conn.
- Townsend Co., New Brighton, Pa.
- Trane Co., La Crosse, Wis.
- Trenton Auto Radiator Wks., 630 Brunswick Ave., Trenton, N. J.
- Trimont Rotary Power Co., 296 Whiting Ave., East Dedham, Mass.
- Triox Engineering Co., 339 N. Taylor St., St. Louis, Mo.
- Tropical Paint & Oil Co., 1244-86 W. 70th St., Cleveland, O.
- Trumbull Electric Mfg. Co., Woodford Ave., Plainville, Conn.
- Truscon Laboratories, 1710 Caniff Ave., Detroit, Mich.
- Truscon Steel Co., Albert St., Youngstown, O.
- Turner & Seymour Mfg. Co., Lawton St., Torrington, Conn.
- Turner Brass Works, 823 Park Ave., Sycamore, Ill.
- Turney Corp., Muskegon, Mich.
- Tuttle Air Filter Co., Inc., 1014 W. Main St., Louisville, Ky.
- Tuttle & Bailey, Inc., Corbin Ave., New Britain, Conn.
- Twentieth Century Heating & Ventilating Co., Ira & Edison Ave., Akron, O.

U

- Uehling Instrument Co., 473 Getty Ave., Paterson, N. J.
- Una Welding, Inc., 1615 Collamer Ave., Cleveland, O.
- Unified Air Conditioner Co., 322 W. Michigan St., Duluth, Minn.
- Uniflow Mfg. Co., East Lake Road, Erie, Pa.
- Union Fibre Co., Inc., Winona, Minn.
- Union Metal Mfg. Co., 1432 Maple Ave., N. E., Canton, O.
- Union Steam Pump Co., Jefferson Ave., Battle Creek, Mich.
- United American Bosch Corp., 3664 Main St., Springfield, Mass.
- United Cork Companies, Central Ave., Kearny, N. J.
- United Electric Controls Co., 69 "A" St., South Boston, Mass.
- United Motors Service, Detroit, Mich.
- U. S. Air Conditioning Corp., 2105 Kennedy St., N. E., Minneapolis, Minn.
- United States Brass & Copper Co., Hyde Park Ave., Hyde Park, Mass.

- United States Burner Corp., 191 Franklin Ave., Hartford, Conn.
 United States Gypsum Co., 300 W. Adams St., Chicago, Ill.
 U. S. Mineral Wool Co., 280 Madison Ave., New York City.
 U. S. Pressed Steel Products Co., P. O. Box 863, 763 E. Vine St., Kalamazoo, Mich.
 United States Radiator Corp., 1056 National Bank Bldg., Detroit, Mich.
 • United States Register Co., Burnham St., Battle Creek, Mich.
 Uni-Therm, Inc., P. O. Box 83, Elyria, O.
 • Universal Blower Co., 124 S. Woodward Ave., Birmingham, Mich.
 Universal Cooler Corp., 7214 Melville St., Detroit, Mich.
 Universal Power Corp., 4300 Euclid, Cleveland, O.
 Universal Steel Co., Bridgeville, Pa.
 Uno Ventilator Co., 339 Lincoln Ave., Cliftondale, Mass.
 Upson Co., Upson Point, Lockport, N. Y.
 Utility Fan & Mfg. Co., 2528 Santa Fe Ave., Los Angeles, Cal.

V

- Vail Mfg. Co., 1017 Columbia Ave., Fort Wayne, Ind.
 Valley Mfg. Co., Fryeville, Athol, Mass.
 Van Noorden Co., E., 100 Magazine St., Boston, Mass.
 Vendor Slate Co., Inc., P. O. Box 204, Nazareth, Pa.
 Vent-O-Lite Co., 4230 W. Taylor St., Chicago, Ill.
 Vermont Structural Slate Co., Fair Haven, Vt.
 Vibration Eliminator Co., 41-26 37th St., Long Island City, N. Y.
 • Victor Electric Products, Inc., 737 Reading Rd., Cincinnati, O.
 Victor Equipment Co., Kimball-Krogh Pump Div., 1010 E. 62nd St., Los Angeles, Cal.
 Victor Oil Burner Mfg. Co., 45 Allyn St., Hartford, Conn.
 Vigor-Aire Corp., 127 S. Fifth St., Philadelphia, Pa.
 Viking Air Conditioning Corp., Main & Center Sts., N. W., Cleveland, O.
 Viking Pump Co., 404 State St., Cedar Falls, Ia.
 • Viking Shear Co., Raspberry St. and Nickel Plate R. R., Erie, Pa.
 Vilter Mfg. Co., 2217 S. First St., Milwaukee, Wis.
 Volcano Burner Corp., 575 E. 184th St., New York City.
 Von Seebeck, G., 50 Pine St., New York City.
 • Vulcan Arc Welder Mfg. Co., 2636 Olive St., St. Louis, Mo.

W

- Waddell, Bruce, 2829 Northwestern Ave., Indianapolis, Ind.
 Wagner, C. DeWitt, 1000 2nd St., S. E., Cedar Rapids, Ia.
 • Wagner Electric Corp., 6400 Plymouth Ave., St. Louis, Mo.
 Walker & Pratt Mfg. Co., 31-35 Union St., Boston, Mass.
 Walker Mfg. & Sales Corp., 1711-1717 Penn St., St. Joseph, Mo.
 Wall Mfg. Supply Co., P., 3126 Preble Ave., Pittsburgh, Pa.
 • Walsh Refractories Corp., 4430 N. First St., St. Louis, Mo.
 Ward Co., H. H., Chester, Pa.
 Ward Heater Co., Ltd., 1800 W. Washington Blvd., Los Angeles, Cal.
 Ward Leonard Electric Co., 37 South St., Mt. Vernon, N. Y.
 • Ward Machinery Co., 564 W. Washington Blvd., Chicago, Ill.
 Ward Mfg. Co., 107-11 E. Milwaukee Ave., Detroit, Mich.
 Warren Shade Co., Inc., 2905 E. Hennepin Ave., Minneapolis, Minn.
 Washington Stove Works, 3402-22 Smith Ave., Everett, Wash.
 Waterfilm Boilers, Inc., 154 Ogden Ave., Jersey City, N. J.
 • Waterloo Register Co., Waterloo, Ia.
 • Waterman-Waterbury Co., 1122 Jackson St., N. E., Minneapolis, Minn.
 Watson Co., Inc., Jas. H., Bradley, Ill.
 • Wattenamel Co., 7400 Archer Ave., Summit, Ill.
 Watts Regulator Co., 250 Lowell St., Lawrence, Mass.
 • Wayne Oil Burner Corp., 800 Glasgow Ave., Fort Wayne, Ind.
 Wayne Pattern & Foundry Co., 236 Murray St., Fort Wayne, Ind.
 Weatherhead Co., 620 Frankfort St., Cleveland, O.
 Webster Electric Co., Dekoven Ave. & Clark St., Racine, Wis.
 Weinman Pump Co., 290 Spruce St., Columbus, O.
 Weirton Steel Co., Weirton, W. Va.
 Weiskittel Co., Inc., Harry C., 4901 Philadelphia Rd., Baltimore, Md.
 Weiss & Co., H., 113-115 Mercer St., New York City.
 Weldex, Inc., 9666 E. Jefferson St., Detroit, Mich.
 Welding Apparatus Co., 4309 Ogden Ave., Chicago, Ill.
 Welding Timer Mfg. Co., 251 Ogden St., Newark, N. J.
 Wells Mfg. Corp., 315 Seventh Ave., Three Rivers, Mich.
 Westchester Home Equipment Co., Inc., 432 Austin Pl., Bronx, N. Y.
 Western Blower Co., 1800 Airport Way, Seattle, Wash.
 Western Felt Works, 4027 Ogden Ave., Chicago, Ill.
 Western Furnaces, Inc., 3002-18 S. Chandler St., Tacoma, Wash.
 Western Rotary Ventilator Co., Inc., 1720 E. 14th St., Los Angeles, Cal.
 Western Venetian Blind Co., 601 W. 26th St., New York City.

- Western Wire & Iron Works, Inc., 945 W. 18th Pl., Chicago, Ill.
 Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. and Mansfield, O.
 Westwick & Son, Inc., John, Claude & Meeker Sts., Galena, Ill.
 Wheeling Corrugating Co., Wheeling Steel Bldg., Wheeling, W. Va.
 Wheeling Metal & Mfg. Co., Box 56, Wheeling, W. Va.
 Wheeling Steel Corp., Wheeling Steel Bldg., Wheeling, W. Va.
 White Co., Kelvin & Wilfred B., 90 State St., Boston, Mass.
 • White Mfg. Co., 2362 University Ave., St. Paul, Minn.
 Whiting Corp., Harvey, Ill.
 Whitlock Coil Pipe Co., 100 South St., Hartford, Conn.
 • Whitney Mfg. Co., W. A., 636 Race St., Rockford, Ill.
 • Whitney Metal Tool Co., 91 Forbes St., Rockford, Ill.
 • Wickwire Spencer Steel Co., 41 E. 42nd St., New York City.
 Wiedemann Machine Co., 1815 Sedgley Ave., Philadelphia, Pa.
 Wilder Metal Co., P. O. Box 189, Niles, O.
 Wilhelm Co., A., 3rd & Bern Sts., Reading, Pa.
 Will-Burt Co., Orrville, O.
 Williams Oil-O-Matic Heating Corp., 1201 E. Bell, Bloomington, Ill.
 Williamson Heater Co., 337 W. Fifth St., Cincinnati, O.
 Willis Mfg. Co., 156 N. Academy St., Galesburg, Ill.
 Will-Weld Mfg. Co., Inc., 600-620 S. 15th St., Omaha, Nebr.
 Wilson & Co., Inc., 4100 S. Ashland Ave., Chicago, Ill.
 Wilson Co., H. A., 97 Chestnut St., Newark, N. J.
 Wilson, Inc., Grant, 4101 W. Taylor St., Chicago, Ill.
 Wilson Welder & Metals Co., Inc., 956 38th St., North Bergen, N. J.
 Winchester Repeating Arms Co., 275 Winchester Ave., New Haven, Conn.
 Windshield Scupper Co., 16 Warren St., New York City.
 Wing Mfg. Co., L. J., 154 W. 14th St., New York City.
 Wisconsin Humidifier Co., 3231 N. Richards St., Milwaukee, Wis.
 • Wise Furnace Co., 101 Lincoln St., Akron, O.
 • Wiss & Sons Co., J., 33 Littleton Ave., Newark, N. J.
 Wittenmeier Machinery Co., 850 N. Spaulding Ave., Chicago, Ill.
 Wodaack Electric Tool Corp., 4627 W. Huron St., Chicago, Ill.
 Wolfe Engineering & Mfg. Co., 1136 Market St., Harrisburg, Pa.
 Wolff Coal Saver Co., 1330 W. Congress St., Chicago, Ill.
 Wolverine Tube Co., 1419 Central Ave., Detroit, Mich.
 Wood Conversion Co., First National Bank Bldg., St. Paul, Minn.
 Wood Industries, Inc., Gar, 7924 Riopelle St., Detroit, Mich.
 Wood Steel Co., Alan, Conshohocken, Pa.
 Wood's Sons Co., T. B., Fifth Ave., Chambersburg, Pa.
 Woolery Machine Co., 2919 Como Ave., S. E., Minneapolis, Minn.
 Woolwine Metal Products Co., Atlantic Blvd. & S. Riverside Dr., Los Angeles, Cal.
 Wooster Art Wood, Inc., P. O. Box 198, Wooster, O.
 Worcester Brush & Scraper Co., Div. Mason Worcester Co., 38 Austin St., Worcester, Mass.
 World Kalamain Sash & Door Corp., 448 Tiffany St., New York City.
 Worthington Pump & Machinery Corp., Worthington Ave., Harrison, N. J.
 Wrought Washer Mfg. Co., 2227 South Bay St., Milwaukee, Wis.

X

- XL Refrigerating Co., Inc., 1834 W. 59th St., Chicago, Ill.
 • XXth Century Heating & Ventilating Co., Ira & Edison Ave., Akron, O.

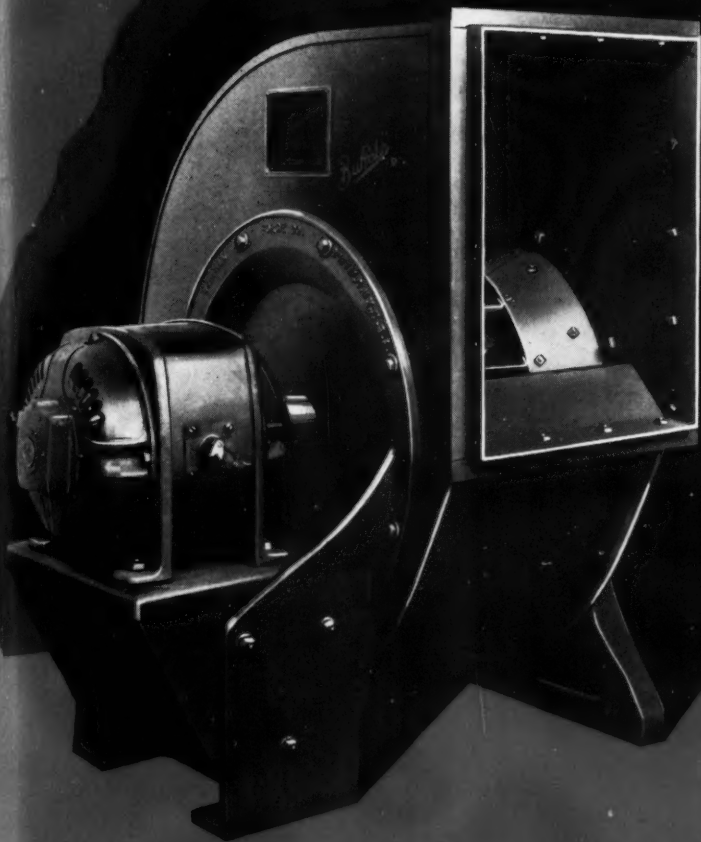
Y

- Yardly Screen & Weather Strip Corp., 142 Parsons Ave., Columbus, O.
 Yeomans Bros. Co., 1433 Dayton St., Chicago, Ill.
 Yoder Co., 5500 Walworth Ave., Cleveland, O.
 York Corrugating Co., Adams St. & WM R.R., York, Pa.
 York Ice Machinery Corp., Roosevelt Ave., York, Pa.
 York Oil Burner Co., Inc., Broad St., York, Pa.
 Young & Bertke Co., 1004-1014 Hulbert Ave., Cincinnati, O.
 Young Radiator Co., 709 Mead St., Racine, Wis.
 Young Regulator Co., 4500 Euclid Ave., Cleveland, O.
 Youngstown Pressed Steel Co., Warren, O.
 • Youngstown Sheet & Tube Co., Stambaugh Bldg., Youngstown, O.

Z

- Zapon-Brevolite Lacquer Co., North Chicago, Ill.
 Zeh & Hahnemann Co., 182-200 Vanderpool St., Newark, N. J.
 Zenith Electric Company, Inc., 607 S. Dearborn St., Chicago, Ill.
 Zonolite Corp. of Montana, 5905 Second Blvd., Detroit, Mich.

Prepare for Profits!



Buffalo better fans
- since 1878



for Quick Service— Call on these Branch Offices

ALBANY, 611 Standard Bldg.	KNOXVILLE, T. F. Sexton, 315 Empire Bldg.
ATLANTA, 724 First National Bank Bldg.	LOS ANGELES, 798 Pershing Sq. Bldg.
BOSTON, 486 Main St., Melrose Sta.	MINNEAPOLIS, 619 Foshay Tower
CHARLOTTE, J. W. Fraser & Co., 124 Brevard Court	NEW ORLEANS, Devlin Bros., 1903 Maritime Bldg.
CHICAGO, 29 No. Wacker Drive	NEW YORK, 39 Cortlandt St.
CINCINNATI, 622 Broadway	PHILADELPHIA, 229 S. Sixteenth St.
CLEVELAND, 418 Rocketteller Bldg.	PITTSBURGH, 431 Fulton Bldg.
DALLAS, 315 South Harwood	SAN FRANCISCO, Moore Machinery Co., 550 Fifth St.
DAVENPORT, 305 Security Bldg.	ST. LOUIS 1596 Arcade Bldg.
DENVER, Hendrie & Bolthoff Mfg. & Supply Co., 1635 Seventeenth St.	SALT LAKE CITY, Salt Lake Hdwe. Co.
DES MOINES, 214 Old Colony Bldg.	SEATTLE, 500 First Ave., S.
DETROIT, Coon De-Visser Co., 2051 W. Lafayette Blvd.	TOLEDO, 1922 Linwood Ave.
KANSAS CITY, 315 Dwight Bldg.	TUCSON, Tidmarsh Engrg. Co.
KITCHENER, Ont., Canadian Blower & Forge Co., Ltd.	WASHINGTON, D. C., 820 Woodward Bldg.

As 1937 opens, it is apparent that a BIG year for Air Conditioning Contractors is before us.

PREPARE FOR PROFITS for yourself by standardizing on Buffalo Fans and "PC" Conditioning Cabinets. One of the oldest manufacturers in the industry, Buffalo offers you a complete line of equipment, sensibly priced, conservatively rated, honestly built.

We are manufacturers—we do NO installing, we do NOT compete directly or indirectly with you.

The branch Engineering offices listed at the left are at your service. Call on them for advice and recommendations. Be "Buffalo-wise"—Standardize!

Buffalo Forge Company, 497 Broadway, Buffalo, N.Y.
In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Buffalo **QUIET Fans for
Air Conditioning**

MILCOR

announces

KUEHN'S GUTTER

— the greatest improvement in rain-
carrying equipment in 40 years

he sensation of
37 in the sheet
metal industry

inequaled for
auty and prac-
ability

priced the same
ordinary eaves
ough

Write for sample
and literature

PATENT
APPLIED
FOR

1
Points

**OF STRENGTH
AND BEAUTY**

The new KUEHN'S GUTTER has 5 Features in its exclusive design which combine to give it far superior strength and unrivaled appearance. These are the special outer bead with stiffening tongue, the three flutings in sides and bottom, the hemmed edge, and the sharply formed corners.

- Stronger by far, than any other.
- Dealers, Builders and Owners demand it.
- The Line is complete with Lap, Slip Joint, Mitres, Ends and Downspouts and Hangers.
- Also a High Back furnished for Gutter Installation.
- Self-cleaning.
- Unquestionably a Sales "NATURAL"

MILCOR STEEL COMPANY

MILWAUKEE, WISCONSIN

CANTON, OHIO

Chicago, Ill.

Kansas City, Mo.

La Crosse, Wis.

TABL
8

FEBRU
19